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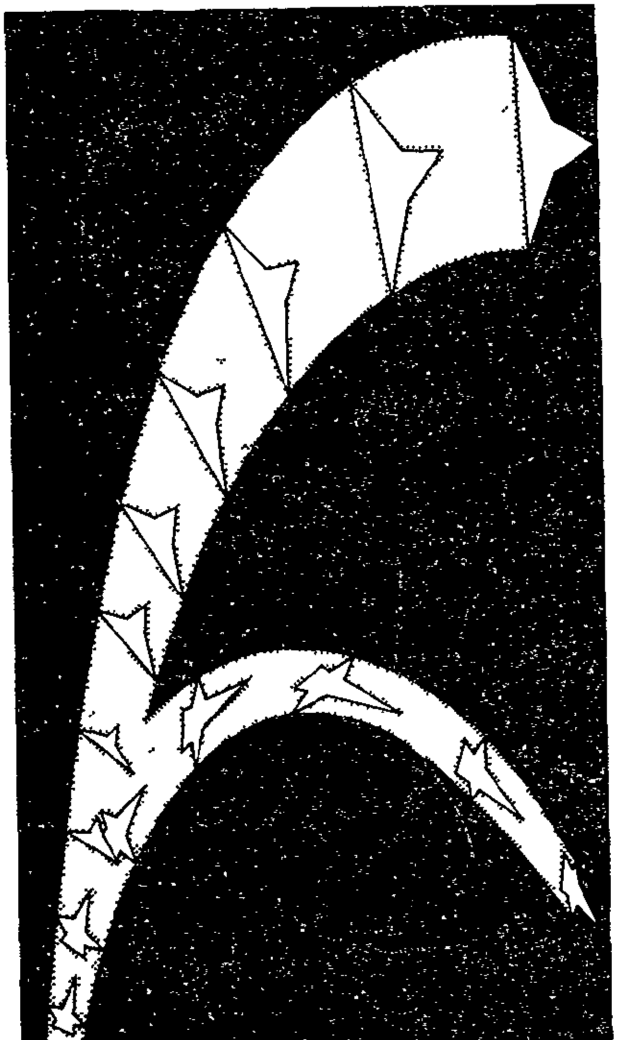

—SPACE SHUTTLE—

INVESTIGATION OF THE AERODYNAMIC CHARACTERISTICS OF THE GAC 518 EARTH ORBITING SHUTTLE, CONFIGURATION IIF, AT MACH NUMBER = .170

GRUMMAN AIRCRAFT
ENGINEERING CORPORATION

WIND TUNNEL TEST RESULTS
DATA REPORT

JANUARY 1971

CONTRACT NAS8-4016

SCHEDULE II

DRL 184-58

SADSAC SPACE SHUTTLE
AEROTHERMODYNAMIC
DATA MANAGEMENT SYSTEM

AMENDMENT 130
MARSHALL
SPACE FLIGHT CENTER

SPACE DIVISION CHRYSLER CORPORATION

TECHNICAL REPORT STANDARD TITLE PAGE

1 REPORT NO NASA CR-103198	2 GOVERNMENT ACCESSION NO
3 RECIPIENT'S CATALOG NO.	
4 TITLE AND SUBTITLE (Space Shuttle) Investigation of the Aerodynamic Characteristics of the GAC 518 Earth Orbiting Shuttle, Configuration IIF, at Mach Number = .170	5 REPORT DATE January 1971
	6 PERFORMING ORGANIZATION CODE CCSD
7 AUTHOR(S) S. Kalemaris, A. McBride and J. Wheeler, GAC	8 PERFORMING ORGANIZATION REPORT # DMS-DR-1053
9 PERFORMING ORGANIZATION NAME AND ADDRESS Chrysler Corporation Space Division Michoud Operations P.O. Box 29200 New Orleans, Louisiana 70129	10 WORK UNIT NO.
	11 CONTRACT OR GRANT NO. NAS8-4016
12 SPONSORING AGENCY NAME AND ADDRESS National Aeronautics and Space Administration George C. Marshall Space Flight Center Marshall Space Flight Center, Alabama 35812	13 TYPE OF REPORT & PERIOD COVERED Contractor
	14 SPONSORING AGENCY CODE S&E-AERO-A

15 SUPPLEMENTARY NOTES

Contractor Monitor: C. Dale Andrews
Aero-Astrodynamics Laboratory

16 ABSTRACT

These tests were designed to provide basic subsonic aerodynamic information on the GAC IIF configuration Earth Orbiting Shuttle. Various lower fuselage camber lines and chine radii were tested in an attempt to increase the body lift without introducing a significant loss in longitudinal or lateral-directional stability. The wing was moved 200" aft in order to provide greater longitudinal stability. Several wing modifications were made to try and increase the stall angle of the wing and delay the subsequent pitch up. A simple hinge flap and a split flap were tested to investigate the high lift characteristics of the model. Also, a canard was tested to provide greater lift and to provide a longitudinal trim surface having a small drag penalty. In addition, base pressure measurements were taken and several aft fuselage modifications were made to reduce base drag.

Contract No. NAS8-4016 with Chrysler Corporation is for data presentation of information generated by various Space Shuttle Phase B Contractors and NASA Centers.

17 KEY WORDS	18 DISTRIBUTION STATEMENT U. S. Government Agencies and contractor only

19 SECURITY CLASSIF (of this report)	20 SECURITY CLASSIF (of this page)	21. NO. OF PAGES	22. PRICE
Unclassified	Unclassified	37 Front 27 Data Plots 64 Total	

MSFC - Form 3292 (May 1969)

DMS-DR-1053

SADSAC/SPACE SHUTTLE

WIND TUNNEL TEST DATA REPORT

CONFIGURATION Grumman Aircraft Corp. IIF Earth Orbiting Shuttle

TEST PURPOSE To determine basic subsonic aerodynamic information on the GAC IIF Configuration Earth Orbiting Shuttle

TEST FACILITY: Grumman 7x10 Ft. Low Speed Wind Tunnel

TESTING AGENCY Grumman Aircraft Corporation

TEST NO & DATE: GWTT-279 February 1970

TEST CONDUCTOR(S) S. Kalemaris, A. McBride, J. Wheeler

DATA MANAGEMENT SERVICES

LIAISON J. Vaughn for J. Zeller DATA OPERATIONS:

RELEASE APPROVAL: N D Kemp

N. D. Kemp, Supervisor
Aero Thermo Data Group

This report has been prepared by Chrysler Corporation Space Division under a Data Management Contract to the NASA Chrysler assumes no responsibility for the data presented herein other than its display characteristics.

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INTRODUCTION

This report presents the data from the first series of tests conducted on a 1/40 scale model of the GAC II F configuration Earth Orbiting Shuttle in the Grumman 7 x 10 ft. Low Speed Wind Tunnel. These tests were conducted from February 13 to February 28, 1970 on a one shift with overtime basis.

The job charge number for this test was 10096-301. Cognizant engineering personnel were:

S. Kalemaris Aerodynamics

A. McBride Aero Test

J. Wheeler Aero Test

SUMMARY

These tests were designed to provide basic subsonic aerodynamic information on the GAC IIF configuration Earth Orbiting Shuttle. Various lower fuselage camber lines and chine radii were tested in an attempt to increase the body lift without introducing a significant loss in longitudinal or lateral-directional stability. The wing was moved 200" aft in order to provide greater longitudinal stability. Several wing modifications were made to try and increase the stall angle of the wing and delay the subsequent pitch up. A simple hinge flap and a split flap were tested to investigate the high lift characteristics of the model. Also, a canard was tested to provide greater lift and to provide a longitudinal trim surface having a small drag penalty.

In addition, base pressure measurements were taken and several aft fuselage modifications were made to reduce base drag.

DESCRIPTION OF TUNNEL

The Grumman wind tunnel is an open return, closed throat, Venturi type tunnel having a 7 x 10 ft. retangular test section.

The rectangular entrance section is equipped with radially faired entrance fairings to give a bell-mouth effect. A honeycomb is located in the entrance section to provide flow straightening, and fine mesh copper screening has been added forward and aft of the honeycomb to smooth out flow pulsations.

A smoothly faired contraction cone connects the entrance section to the test section. Corner fairings begin at the start of the contraction cone and gradually increase in size until they enter the test section. The corner fairings in the test section are given a slight downstream divergence to reduce bouyancy effects.

The diffuser section changes from rectangular at the end of the test section to square at the beginning of the transition section, while the transition section smoothly fairs into a circular section at the propeller ring.

The test section will accommodate models up to an eight foot wing span. The tunnel may be operated at any speed up to 160 mph. At this speed, the motor is delivering approximately 1200 H.P., giving the tunnel an energy ratio of 1.0.

The balance system measures all forces applied to the model up to the following capacities: Lift, + 4000 lbs. - 2000 lbs., drag and side force +500 lbs., pitching, rolling and yawing moments ± 1200 ft.-lbs.

TEST CONDITIONS
TEST GWTT 279

MACH NUMBER	REYNOLDS NUMBER per unit length	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)
.17	1.6×10^6	.278	70°

BALANCE UTILIZED: YOKE-TYPE L.S.W.T. BALANCE

	CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF	+4000 lb to -2000 lbs.	± .5 lbs.	± .002
SF	± 500 lbs	± .2 lbs.	± .001
AF	± 500 lbs	± .2 lbs	± .0005
PM	± 1200 ft-lbs.	± 1 ft-lb.	± .005
YM	± 1200 ft-lbs	± 1 ft-lb.	± .005
RM	± 1200 ft-lbs	± 1 ft-lb	± .005

COMMENTS:

DATA REDUCTION

The data from the six component mechanical balance was transferred to a nominal cg located at FS 1094 (nose is at FS 0), WL 972, and BL 0, which is 2.35" aft of and 0.7" below the trunnion pin for the model in the upright position. The model constants used for data reduction are listed below:

S_w (Wing area) = 2.50 ft.^{2}

mgc (mean geometric chord) = 1.2075 ft.

b_w (wing span) = 2.50 ft.

The data was corrected theoretically for tunnel blockage and wall effects in accordance with the methods set forth in Ref. 1, 2, 3.

The corrections for the tare and interference effects of the support system and the tunnel flow angularity were measured at the beginning of the test. These values are on file in the Aero Test Department.

The tuft flow visualization photographs and the base pressure data are not presented herein but are in file in the Aero Test Department.

CONFIGURATIONS INVESTIGATED

CONFIGURATION NOMENCLATURE

B = BODY

N= NOZZLES

W = WING

T = "V" TAIL

F = FLAPS

C = CANARD

K = STRAKE

Refer to the pages immediately following for dimensional data on the above components.

COMBINATIONS TESTED

B_2N_1

$B_2N_1W_1$

$B_1N_1W_1$

$B_1N_1W_1T_1$

B_1N_1

$B_{10}N_1W_4$

$B_{10}N_1W_4F^{30}$

$B_{10}N_1W_4F^{30}C$

$B_{10}N_1W_4F^{30}C^{10}$

$B_{10}N_1W_{12}$

$B_{10}N_1W_{12}K$

MODEL COMPONENT: BODY - (B_1)

GENERAL DESCRIPTION: BASIC DESIGN 518 II F configuration of the GAC 1/40 scale Earth Orbiting Shuttle.

DRAWING NUMBER: 518 MOD 300

DIMENSIONS:	FULL-SCALE ft. or ft.^{2}	MODEL SCALE in. or in.^{2}
Length	163.8	49.1
Max. Width		
Max. Depth		
Fineness Ratio		
Area		
Max. Cross-Sectional	887	79.8
Planform	5350	481.5
Wetted		
Base	628	56.5

MODEL COMPONENT: WING (W_1)

GENERAL DESCRIPTION. Basic Design 518 II f configuration wing of the GAC 1/40 scale Earth Orbiting Shuttle.

DRAWING NUMBER: 518 MOD 301

DIMENSIONS:	FULL-SCALE ft. or ft.^{2}	MODEL SCALE in or in.^{2}
TOTAL DATA		
Area		
Planform	4000	360
Wetted		
Span (equivalent)	100	30
Aspect Ratio	2.5	2.5
Rate of Taper		
Taper Ratio	.116	.116
Diehedral Angle, degrees	0°	0°
Incidence Angle, degrees	3°	3°
Aerodynamic Twist, degrees		
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge		
Trailing Edge		
0.25 Element Line	43°41'	43°41'
Chords:		
Root (Wing Sta. 0.0)	860 inches	21.5
Tip, (equivalent)	100 inches	2.5
~~MAC~~ mgc	48.3	14.5
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		
Airfoil Section	MEAN: 64 A.2	SHAPE: 0010
Root		
Tip		
EXPOSED DATA		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

MODEL COMPONENT. TAIL (T)

GENERAL DESCRIPTION: IIf Configuration "V" tail of GAC Earth Orbiting Shuttle.

DRAWING NUMBER: 518 MOD 302

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area	515 $ft.^2$/panel	46.35 $in.^2$/panel
Span (equivalent)	25.8 ft.	7.74 in.
Inb'd equivalent chord	354 in.	8.85 in.
Outb'd equivalent chord	140 in.	3.5 in.
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord		
At Outb'd equiv. chord		
Sweep Back Angles, degrees		
Leading Edge	48^{o}	48^{o}
Tailing Edge	22^{o}	22^{o}
Hingeline		
Area Moment (Normal to hinge line)		
Airfoil Section	NACA 64A008	
Aspect Ratio	1.3	
Taper Ratio	.395	

MODEL COMPONENT: FLAPS (F)

GENERAL DESCRIPTION: Full span trailing edge flaps

1/40 scale IIf configuration GAC E.O.S.

Superscript denotes deflection in degrees

DRAWING NUMBER: ______

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area	219.5 $ft.^2$/panel	19.8$in.^2$/panel
Span (equivalent)	full span	
Inb'd equivalent chord		
Outb'd equivalent chord		
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	11%	
At Outb'd equiv. chord	64%	
Sweep Back Angles, degrees		
Leading Edge		
Tailing Edge		
Hingeline		
Area Moment (Normal to hinge line)		

MODEL COMPONENT: CANARD (C)

GENERAL DESCRIPTION: Triangular Canard

1/40 scale II f configuration GAC E.O.S.

Superscript denotes deflection

DRAWING NUMBER: Figure 7

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area	50 $ft.^2$	4.5 $in.^2$
Span (equivalent)	10 ft.	3 in.
Inb'd equivalent chord		
Outb'd equivalent chord		
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord		
At Outb'd equiv. chord		
Sweep Back Angles, degrees		
Leading Edge	45°	45°
Tailing Edge	0°	0°
Hingeline		
Area Moment (Normal to hinge line)		

MODEL COMPONENT. STRAKE (K)

GENERAL DESCRIPTION: Perpendicularly mounted on wing. T.E. of strake is at T.E. of wing.

DRAWING NUMBER: Figure 8

DIMENSIONS:	FULL-SCALE feet	MODEL SCALE inches
Area		
Span (equivalent)		
Inb'd equivalent chord		
Outb'd equivalent chord		
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord		
At Outb'd equiv. chord		
Sweep Back Angles, degrees		
Leading Edge	47.5°	47.5°
Tailing Edge		
Hingeline		
Area Moment (Normal to hinge line)		
Airfoil Section	NACA 64A008	
Root Chord	23.3	7.0
Tip Chord	16.25	4.875
Location inboard from tip	18.3	5.5
Height	15	4.5

TEST GWTT 279 DATA SET COLLATION SHEET

GAC IIf CONFIGURATION 1/40 SCALE EARTH ORBITING SHUTTLE - LOW SPEED AERODYNAMIC FORCE TEST

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD α	SCHD β	CONTROL DEFLECTION δ_F	δ_C			NO of RUNS	MACH NUMBERS .17											
RCL011	B_2N_1	A	0	0	OFF			1	22											
RCL021	$B_2N_1W_1$	A	0	↓	↓			1	23											
RCL032	$B_1N_1W_1$	5	B					1	28											
RCL042	$B_1N_1W_1T$	5	B					1	46											
RCL052	B_1N_1	5	B					1	52											
RCL063	$B_{10}N_1W_4$	C	0	↓				1	123											
RCL073	$B_{10}N_1W_4F^{30}$	C	0	30	↓			1	125											
RCL083	$B_{10}N_1W_4F^{30}C$	C	0	30	0			1	126											
RCL093	$B_{10}N_1W_4F^{30}C^{10}$	C	0	30	10			1	127											
RCL103	$B_{10}N_1W_{12}$	C	0	0	OFF			1	129											
RCL113	$B_{10}N_1W_{12}K$	C	0	↓	↓			1	130											

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CL	CD	CY	CLM	CLN	CSL							

COEFFICIENTS. → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

α A = −10° to 30° by 2°

β B = −4° to 10° by 2°

α C = −4° to 30° by 2°

TEST GWTT 279 DATA SET DESCRIPTOR SHEET

DATA SET IDENTIFIER	DATA SET DESCRIPTOR	Mode Type	CURVE SLOPE RANGE LOWER LIMIT	CURVE SLOPE RANGE UPPER LIMIT
RCL011	GWTT 279-GAC II F CONF EOS-B2M1	1,1		
RCL021	B2N1W1	1,1		
RCL032	B1N1W1	2,1		
RCL042	B1N1W1T1	2,1		
RCL052	B1N1	2,1		
RCL063	B1ON1W4	1,1		
RCL073	B1ON1W4F30	1,1		
RCL083	B1ON1W4F30C	1,1		
RCL093	B1ON1W4F30C10	1,1		
RCL103	B1ON1W12	1,1		
RCL113	B1ON1W12K	1,1		

SREF(1)	SREF(2)	LREF(1)	LREF(2)	BREF(1)	BREF(2)	XMRP(1)	XMRP(2)
2.50	SQ FT.	1.2075	FT.	2.50	FT.	1044.0	IN

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0	IN	972.0	IN.	0.025		

FOLDOUT FRAME 1

FOLDOUT FRAME 2

FOLDOUT FRAME 3

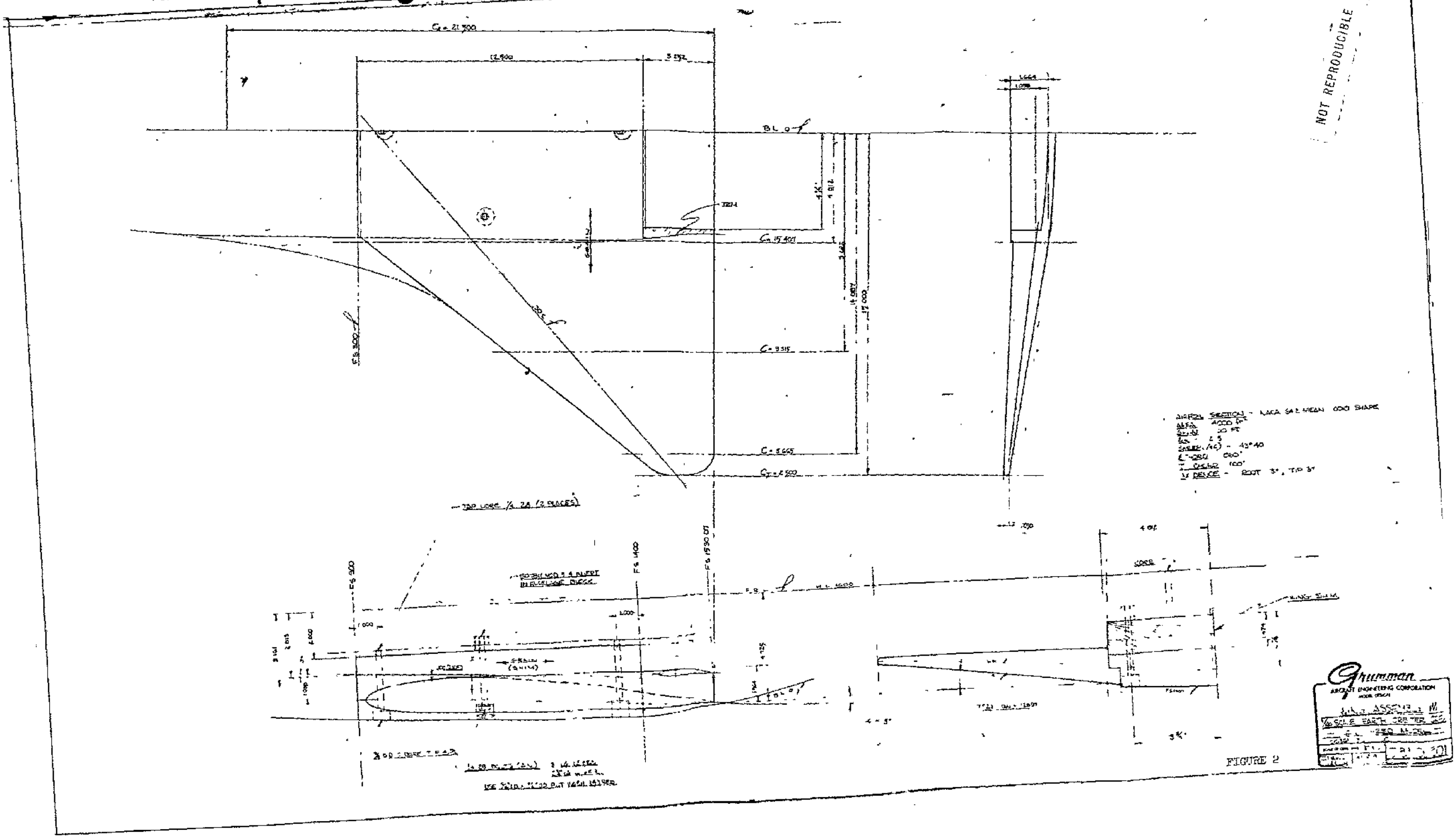
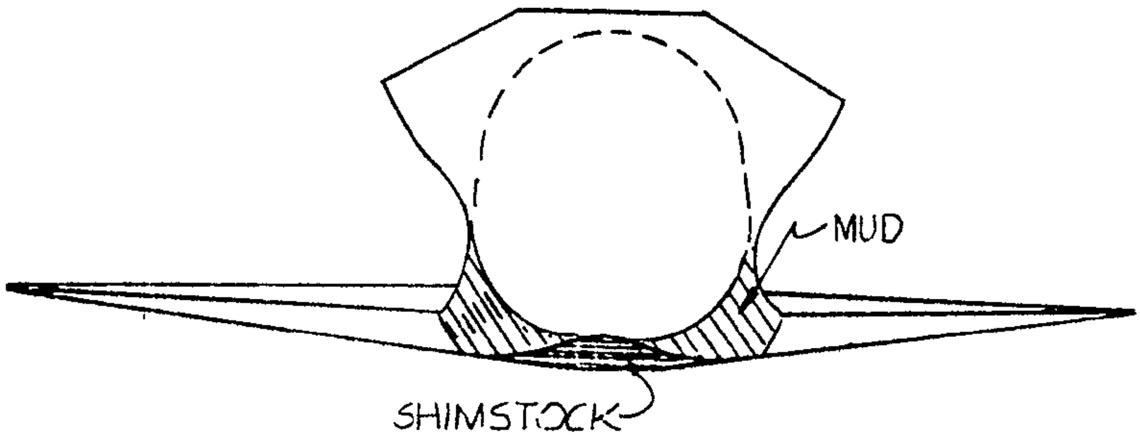


FIGURE 2

B10 W4



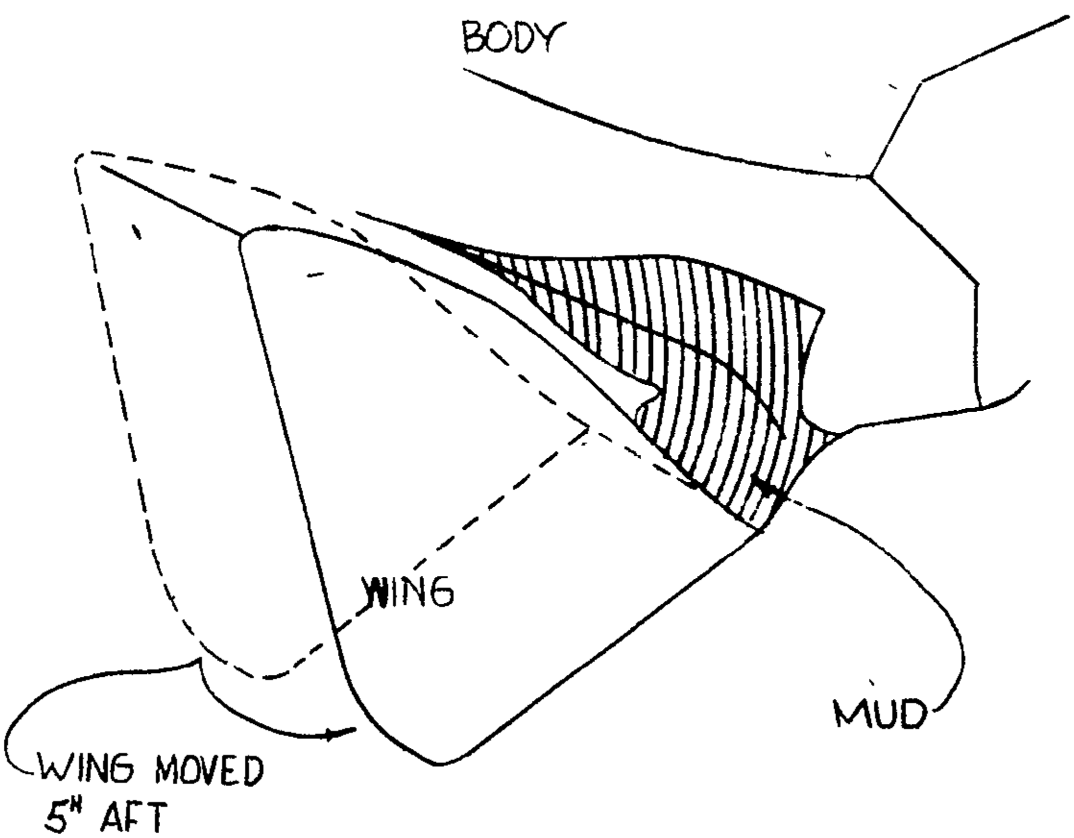
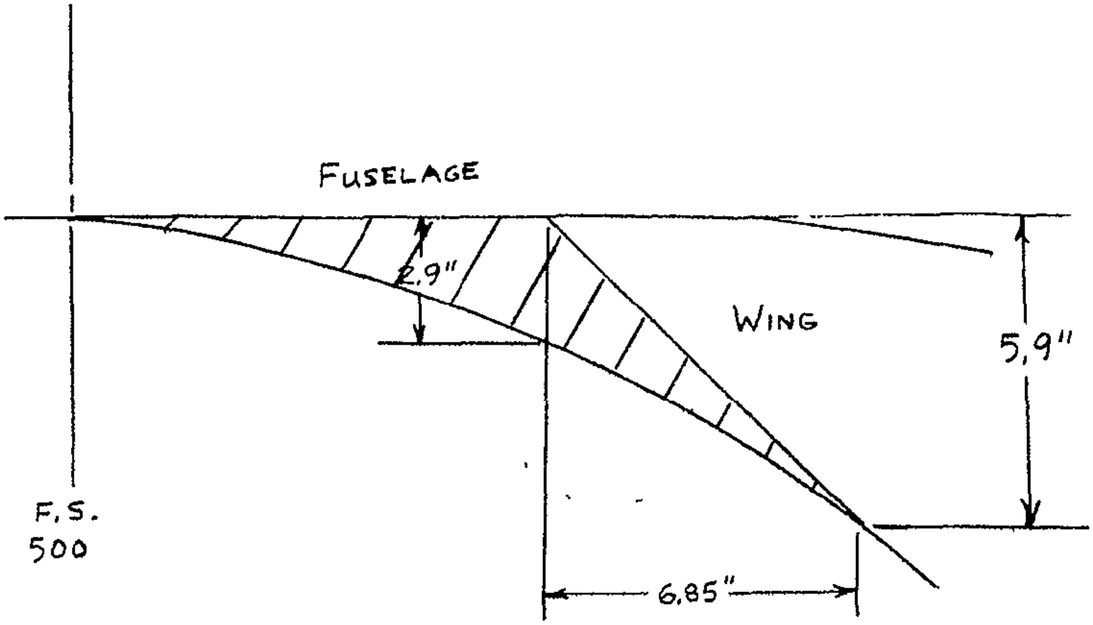
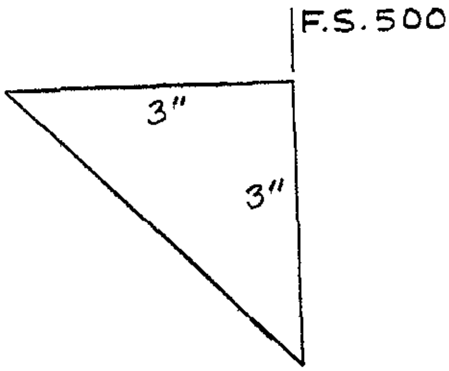


FIGURE 5

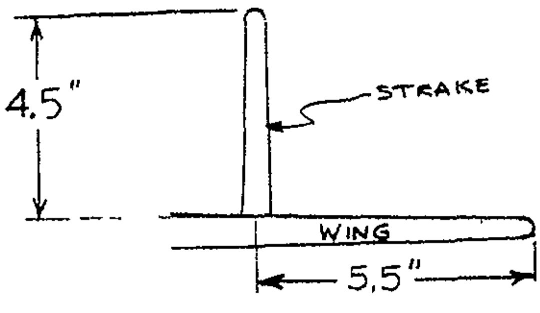
GWTT 279
FEB. 1970



$\underline{\underline{W_{12}}}$ (fig. 6)



CANARD (fig 7)



STRAKE

FIGURE 6

Notes:

1. Positive directions of force coefficients moment coefficients, and angles are indicated by arrows.

2. For clarity, origins of wind and stability axes have been displaced from the center of gravity.

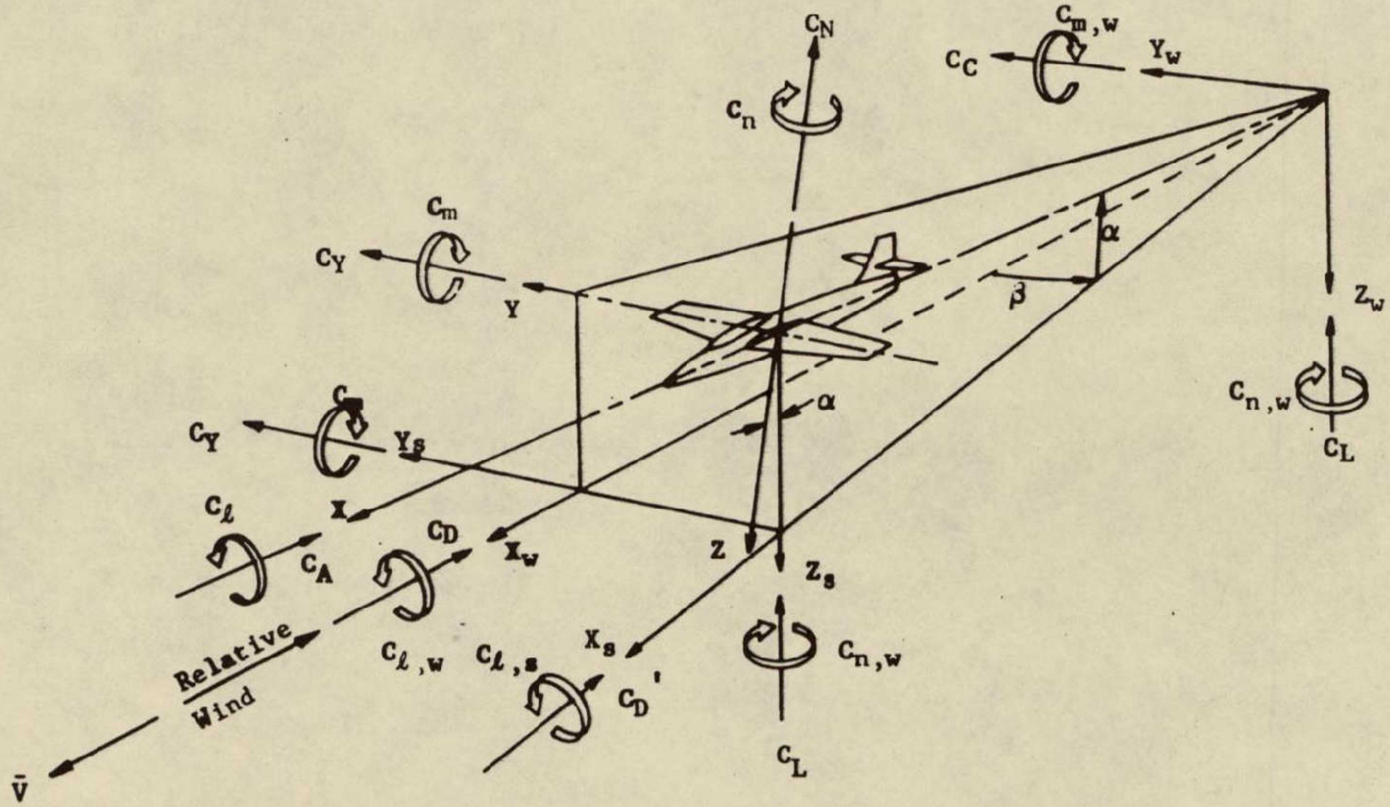


Figure 7. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle

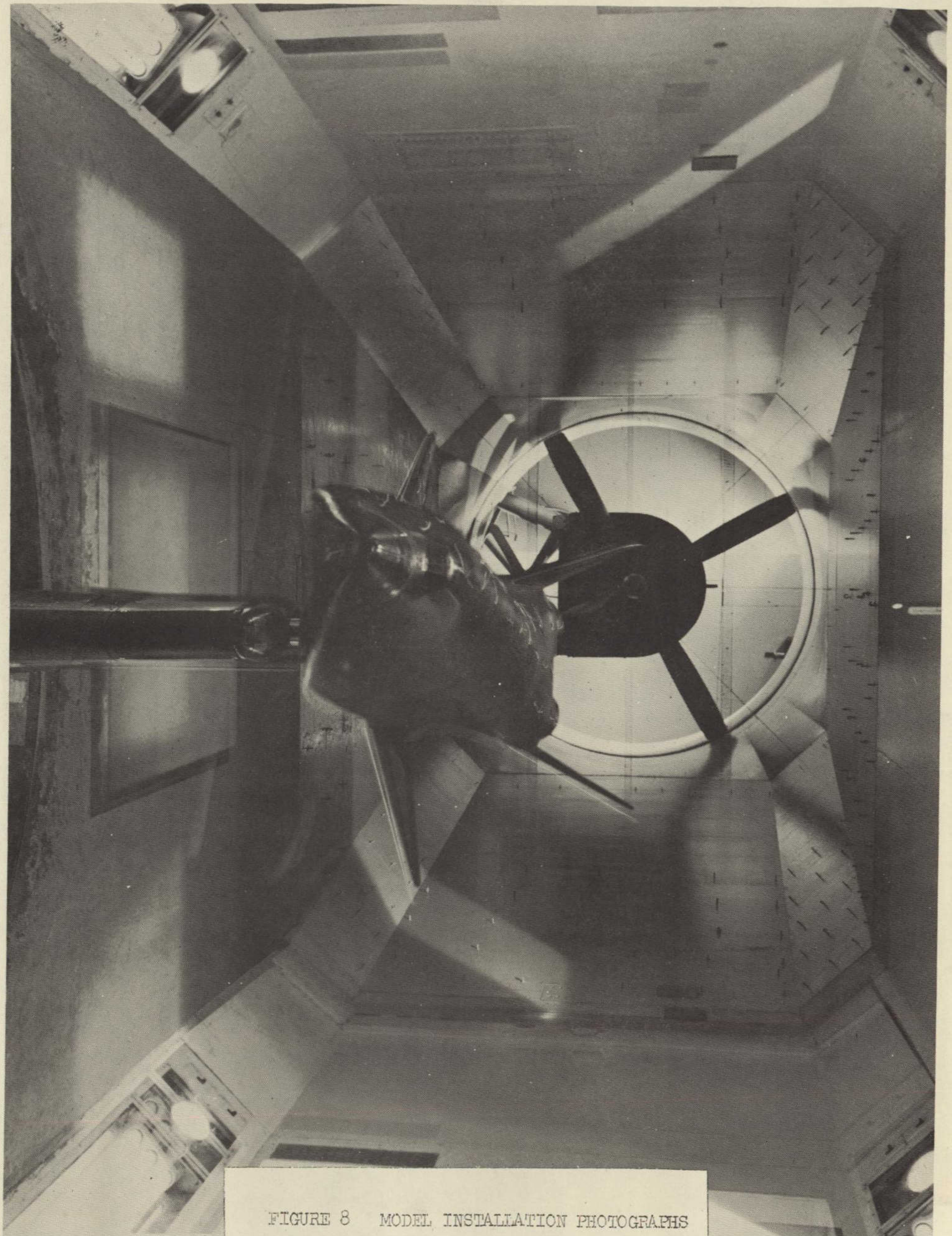
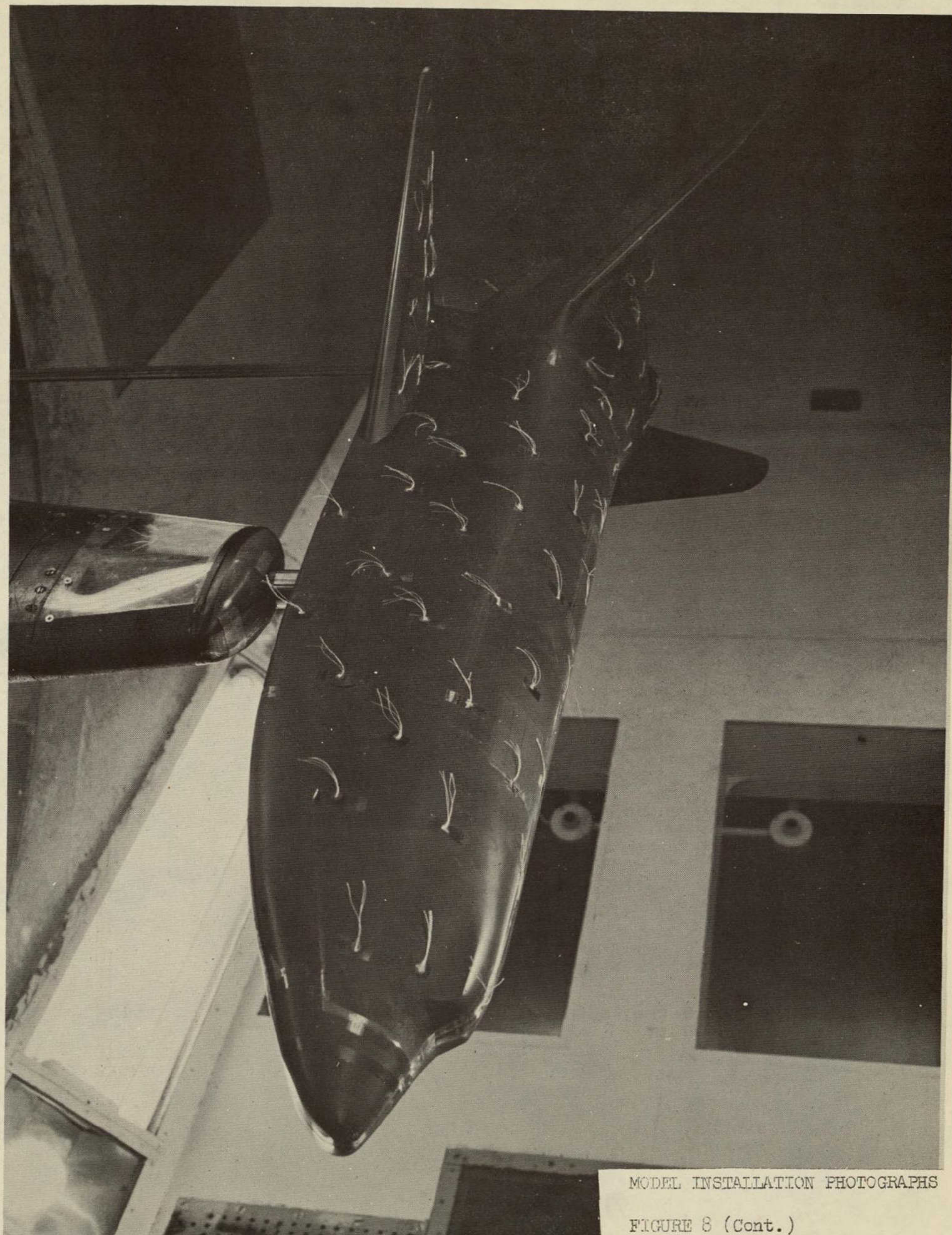


FIGURE 8 MODEL INSTALLATION PHOTOGRAPHS



MODEL INSTALLATION PHOTOGRAPHS

FIGURE 8 (Cont.)

NOMENCLATURE

SYMBOL	SADSAC SYMBOL	DEFINITION
A_b		base area; m^2, ft^2, in^2
a		speed of sound; m/sec, ft/sec
AR	ASPECT	aspect ratio, b^2/S
b	REFB	wing span or reference span; m, ft, in
c		wing chord; m, ft, in
$\bar{c}$		wing mean aerodynamic chord or reference chord; m, ft, in (see ℓ_{ref} or refl)
c.g.		center of gravity
C.P.		center of pressure
C_A	CA	axial force coefficient, F_A/qS_{ref}
C_{A_b}	CAB	base axial force coefficient, $[(p_\infty - p_b)/q]$ (A_b/S_{ref})
C_{A_f}	CAF	forebody axial force coefficient, $C_A - C_{A_b}$
C_D	CDTOTL	drag force coefficient in the wind axis system, $F_D/q\,S_{ref}$

SYMBOL	SADSAC SYMBOL	DEFINITION
C_D'	CD	drag force coefficient in the stability axis system, $F_D'/q\ S_{ref}$
C_L	CL	lift force coefficient (stability or wind axis) $F_L/q\ S_{ref}$
C_ℓ	CBL	rolling moment coefficient in body axis system, $M_x/q\ S_{ref}\ b$
$C_{\ell,s}$	CSL	rolling moment coefficient in the stability axis system, $M_{x,s}/q\ S_{ref}\ b$
$C_{\ell,w}$	CWL	rolling moment coefficient in the wind axis system, $M_{x,w}/q\ S_{ref}\ b$
C_m	CLM	pitching moment coefficient in the body axis system, $M_y/q\ S_{ref}\ \ell_{ref}$
$C_{m,s}$	CLM	pitching moment coefficient in the stability axis system, $C_{m,s} = C_m$
$C_{m,w}$	CPM	pitching moment coefficient in the wind axis system, $M_{y,w}/q\ S_{ref}\ \ell_{ref}$
C_N	CN	normal force coefficient in the body axis system, $F_N/q\ S_{ref}$

SYMBOL	SADSAC SYMBOL	DEFINITION
C_n	CYN	yawing moment coefficient in the body axis system, $M_z/q\,S_{ref}\,b$
$C_{n,s}$	CLN	yawing moment coefficient in the stability axis system, $C_{n,s} = C_n$
$C_{n,w}$	CLN	yawing moment coefficient in the wind axis system, $M_{z,w}/q\,S_{ref}\,b$
C_p	CP	pressure coefficient, $(p-p_\infty)/q$
C_y	CY	side force coefficient (body or stability axis system), $F_y/q\,S_{ref}$
C_c	CC	side force coefficient (wind axis system), $F_y/q\,S_{ref}$
F_A		axial force; N, lb
F_D		drag force in wind axis system; N, lb
F_D'		drag force in the stability axis system; N, lb
F_L		lift force (stability or wind axis system); N, lb
F_N		normal force; N, lb

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
F_Y		side force; N, lb
	N/A	normal to axial force ratio
ℓ_{ref}	REFL	reference length; m, ft, in (see $\bar{c}$)
L/D	L/D	lift-to-drag ratio, C_L/C_D (stability axis system)
L/D	CL/CD	lift-to-drag ratio, C_L/C_D (wind axis system)
M	MACH	Mach number
MRP	MRP	abbreviation for moment reference point
	XMRP	abbreviation for moment reference point on x-axis
	YMRP	abbreviation for moment reference point on y-axis
	ZMRP	abbreviation for moment reference point on z-axis
M_x		rolling moment in the body axis system; N-m, ft-lb
$M_{x,s}$		rolling moment in the stability axis system; N-m, ft-lb

SYMBOL	SADSAC SYMBOL	DEFINITION
$M_{x,w}$		rolling moment in the wind axis system; N-m, ft-lb
M_y		pitching moment in the body (or stability) axis system; N-m, ft-lb
$M_{y,w}$		pitching moment in the wind axis system; N-m, ft-lb
M_z		yawing moment in the body axis system; N-m, ft-lb
$M_{z,w}$		yawing moment in the wind axis system; N-m, ft-lb
p		static pressure; N/m^2; psi
P		total pressure; N/m^2; psi
q	Q(PSI) Q(PSF)	dynamic pressure; N/m^2, psi, psf
RN/L	RN/L	Reynold's number per unit length; million/ft.
S		wing area; m^2, ft^2
S_{ref}	REFS	reference area; m^2, ft^2
T		temperature; °K, °C, °R, °F
V		speed of vehicle relative to surrounding atmosphere; m/sec, ft/sec

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
i_T		tail incidence positive when trailing edge down, deg
$\bar{V}$		velocity of vehicle relative to surrounding atmosphere; m/sec, ft/sec
α	ALPHA	angle of attack, angle between the projection of the wind X_W-axis on the body X, Z-plane and the body X-axis; deg
β	BETA	sideslip angle, angle between the wind X_W-axis and the projection of this axis on the body X-Z-plane; deg
γ		ratio of specific heats
Γ	DIHDRL	wing dihedral angle; deg
δ		control surface deflection angle; deg positive deflections are:
	AILRON	aileron - left aileron trailing edge down
	ELVATR	elevator - trailing edge down
	RUDDER	rudder - trailing edge to the left
	FLAP	flap - trailing edge down
	TAB	tab - trailing edge down with respect to control surface
ρ		air density; K_g/m^3, slugs/ft^3

B_2 B_1 with square chine radius (CH # 2 of 518 MOD 305)

B_{10} B_1 modified to accommodate wing in the 200" aft position (See Fig. 5).

W_4 W_1 moved 200" aft and faired into fuselage. (See Figure 5).

W_{12} W_4 with thick buildup on wing fillets. (See Figure 6).

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
θ		pitch angle, angle of rotation about the body Y-axis, positive when the positive Z-axis is rotated toward the positive X-axis; deg
ϕ	PHI	roll angle, angle of rotation about the body X-axis, positive when the positive Y-axis is rotated toward the positive Z-axis; deg
ψ	PSI	yaw angle, angle of rotation about the body Z-axis, positive when the positive X-axis is rotated toward the positive Y-axis; deg

NOMENCLATURE (continued)

SUBSCRIPTS	DEFINITION
a	aileron
b	base
c	canard
e	elevator or elevon
f	flap
r	rudder or ruddervator
s	stability axis system
t	tail, or total conditions
w	wind axis system
ref	reference conditions
∞	freestream condition

REFERENCES

1. Grumman Low Speed Wind Tunnel Manual.

2. "Lift Interference on Three-Dimensional Wings", H.C. Garner, and "Blockage Effects in Closed or Open Tunnels"; E. W. Rogers, From Subsonic Wind Tunnel Wall Corrections; H. C. Garner et al; October, 1966.

3. A Theory of the Blockage Effects on Bluff Bodies and Stalled Wings in a Closed Wind Tunnel; E. C. Maskill; ARC R&M 3400; 1963.

4. Pretest Outline of Series T Tests on a 1/40 Scale Design 518-TI F Earth Orbital Shuttle in the Grumman Low Speed Wind Tunnel; AER/T-PT-102; A. McBride, February, 1970.

PLOT DATA INDEX

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
SCL011 SCL021

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	1	1
CD	ALPHA	2	2
CLM	ALPHA	3	3
L/D	ALPHA	4	4

DATASETS PLOTTED:
BCL011 BCL021

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	5	5
CA	ALPHA	6	6

DATASETS PLOTTED:
SCL063 SCL073 SCL083 SCL093

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	7	7
CD	ALPHA	8	8
CLM	ALPHA	9	9
L/D	ALPHA	10	10

DATASETS PLOTTED:
BCL063 BCL073 BCL083 BCL093

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	11	11
CA	ALPHA	12	12

DATASETS PLOTTED:
SCL103 SCL113

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	13	13

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. I?F EARTH ORBITING SHUTTLE

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
SCL103 SCL113

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	ENDING
CD	ALPHA	14	14
CLM	ALPHA	15	15
L/D	ALPHA	16	16

DATASETS PLOTTED:
BCL103 BCL113

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	ENDING
CN	ALPHA	17	17
CA	ALPHA	18	18

DATASETS PLOTTED:
SCL052 SCL032 SCL042

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	ENDING
CY	BETA	19	19
CLN	BETA	20	20
CSL	BETA	21	21

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. 1TF EARTH ORBITING SHUTTLE

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
SCL011 SCL021

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	22	22
CL	CD	23	23

DATASETS PLOTTED:
SCL063 SCL073 SCL083 SCL093

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	24	24
CL	CD	25	25

DATASETS PLOTTED:
SCL103 SCL113

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	26	26
CL	CD	27	27

TABULATED DATA LISTING

A tabulated data listing, consisting of all aero data sets, both original and those created in arriving at the plotted material to be presented subsequently, is available as an addendum to this report. The tabular listing is made up in three sections:

(a) a brief summary list of all data sets containing the identifier, the descriptor, and the resident dependent variables.

(b) an expanded list of all data sets, containing the identifier, the descriptor, the resident dependent variables, reference data, parameters and respective values, and independent variable ranges.

(c) the full list of all data sets containing all resident or selected aerodynamic coefficients of the data sets as well as the above mentioned information.

The listing is currently sent on limited distribution to the following organizations:

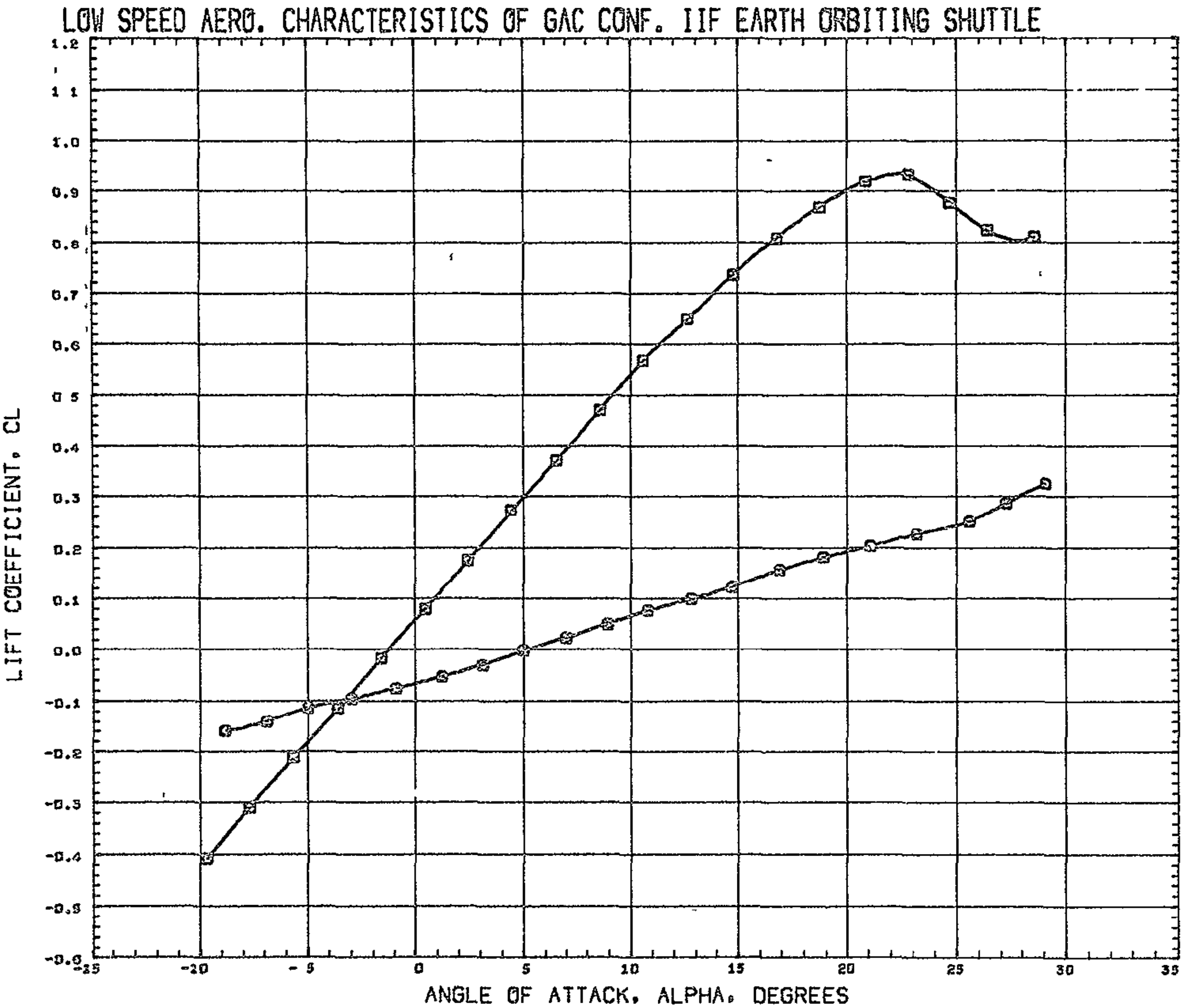
NASA AMES	Mr. John Axelson
NASA LaRC	Mr. David Stone
NASA MSC	Mr. Ray Nelson
NASA MSFC	Mr. Jim Weaver

If copies of this listing are desired, please contact the above or the cognizant SADSAC personnel who, for this data, is:

James R. Ziler
Department 2780
Chrysler Corporation Space Division
New Orleans, La. 70129

(504) 255-2214
(504) 255-2330

PLOTTED DATA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL011)	○	GWTT 279-GAC IIF CONF.EOS-B2N1
(SCL021)	□	GWTT 279-GAC IIF CONF. EOS-B2N1W1

PARAMETRIC VALUES

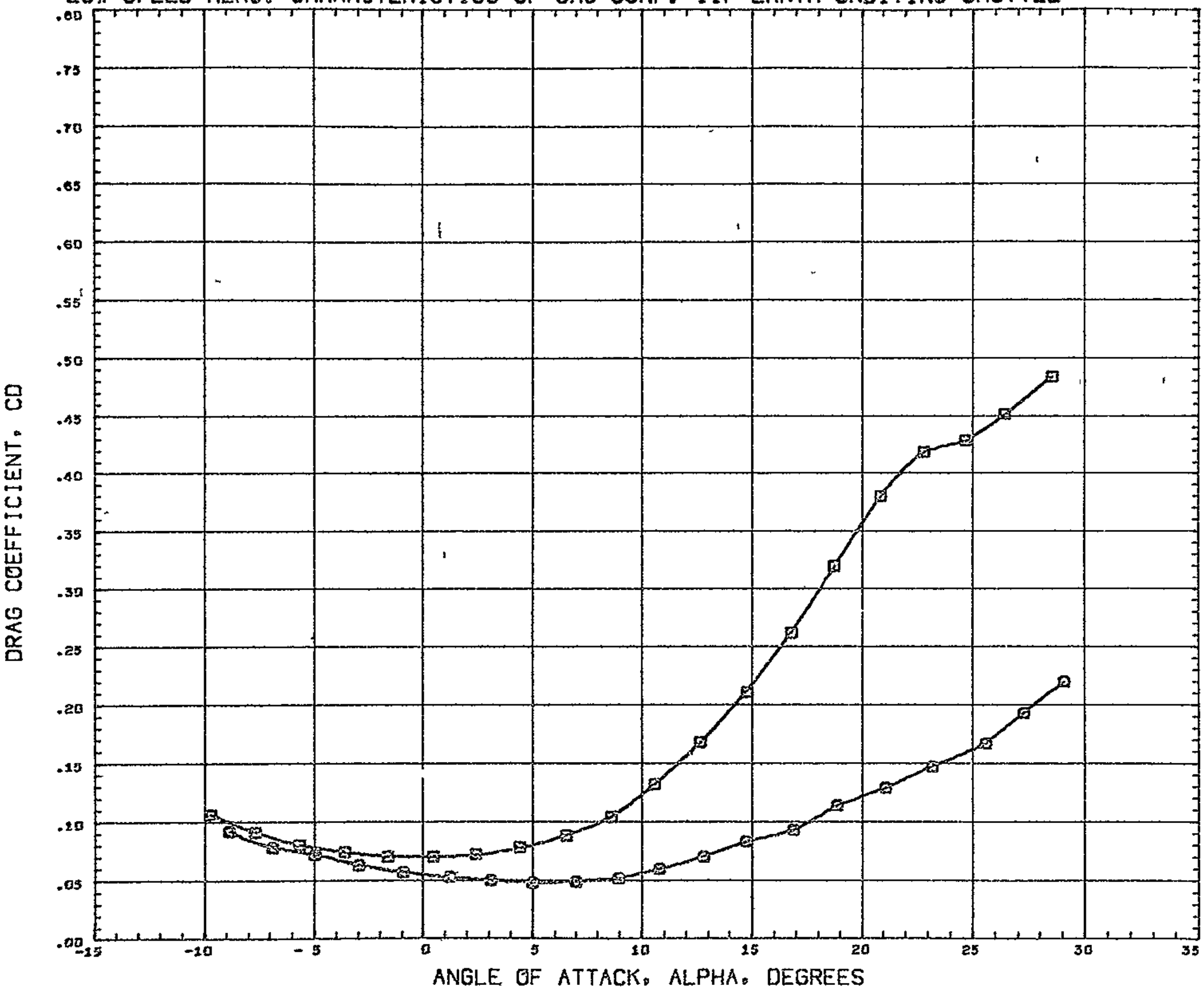
BETA 0.000 FLAP 0.000

REFERENCE INFORMATION

REFS	2.5000	SQ FT
REFL	1.2075	FT
REFB	2.5000	FT
XMRP	1094.0040	IN
YMRP	0.0000	IN
ZMRP	972.0004	IN
SCALE	0.0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL011)	◻	GWTT 279-GAC IIF CONF.EOS-B2N1
(SCL021)	◻	GWTT 279-GAC IIF CONF EOS-B2N1W1

PARAMETRIC VALUES

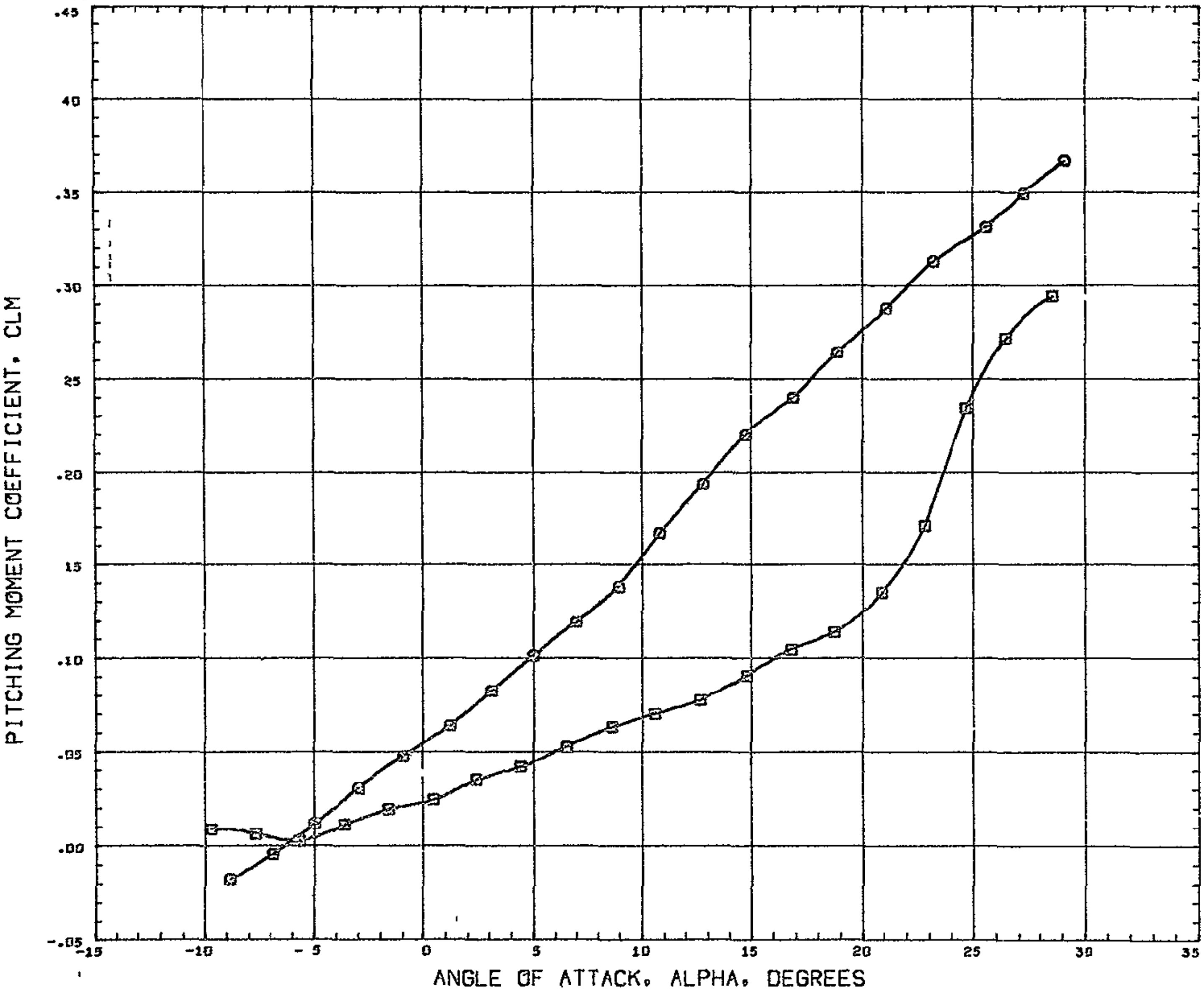
BETA 0 000 FLAP 0.000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMPP	972 0004	IN
SCALE	0 0250	

MACH 0 170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL011)	○	GWTT 279-GAC IIF CONF EOS-B2N1
(SCL021)	□	GWTT 279-GAC IIF CONF EOS-B2N1W1

PARAMETRIC VALUES

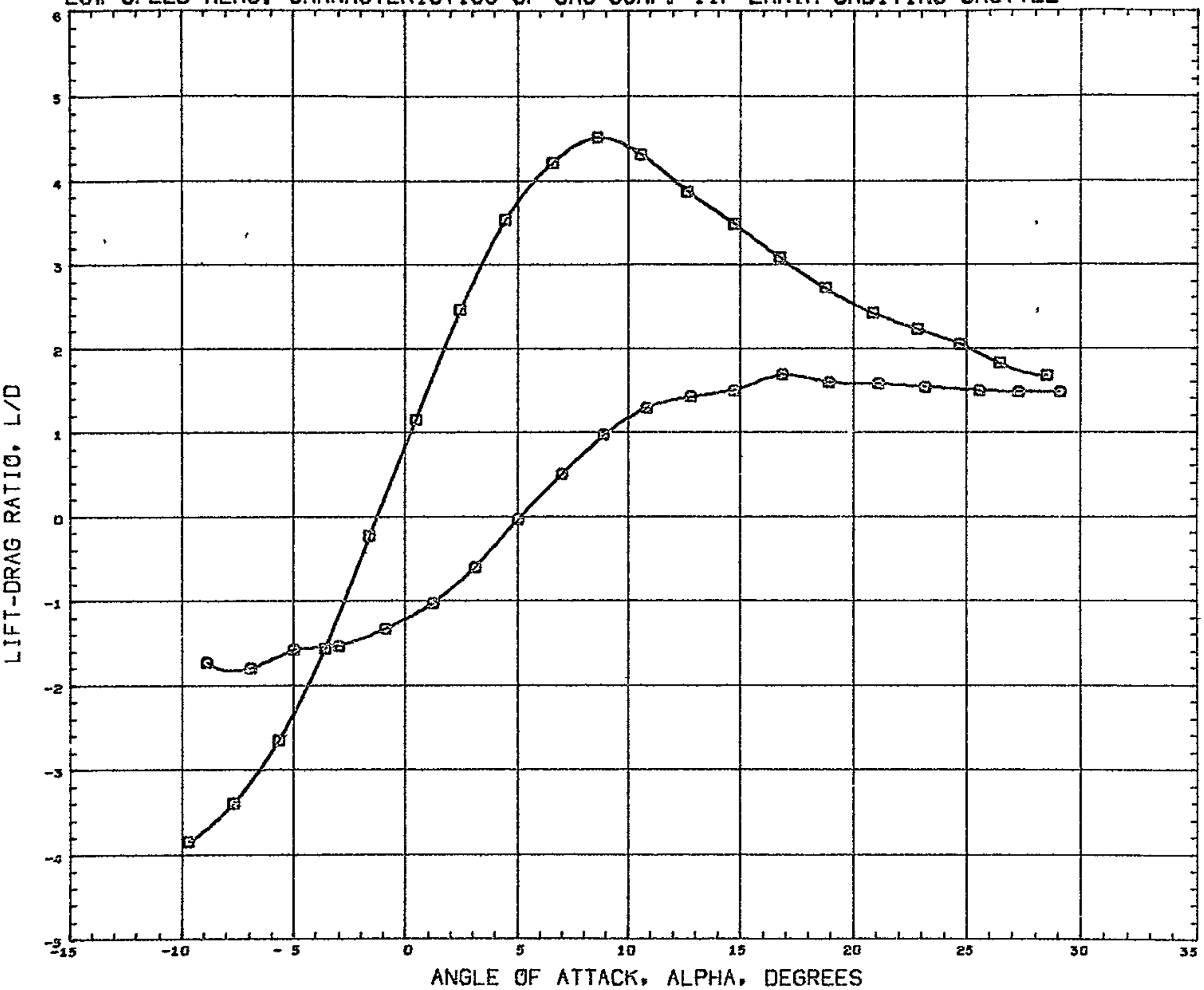
BETA 0.000 FLAP 0.000

REFERENCE INFORMATION

REFS	2.5000	SQ FT
REFL	1.2075	FT
REFB	2.5000	FT
XMRP	1094.0040	IN.
YMRP	0.0000	IN
ZMRP	972.0004	IN
SCALE	0.0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL011)	O	GWTT 279-GAC IIF CONF.EOS-B2N1
(SCL021)	□	GWTT 279-GAC IIF CONF. EOS-B2N1W1

PARAMETRIC VALUES

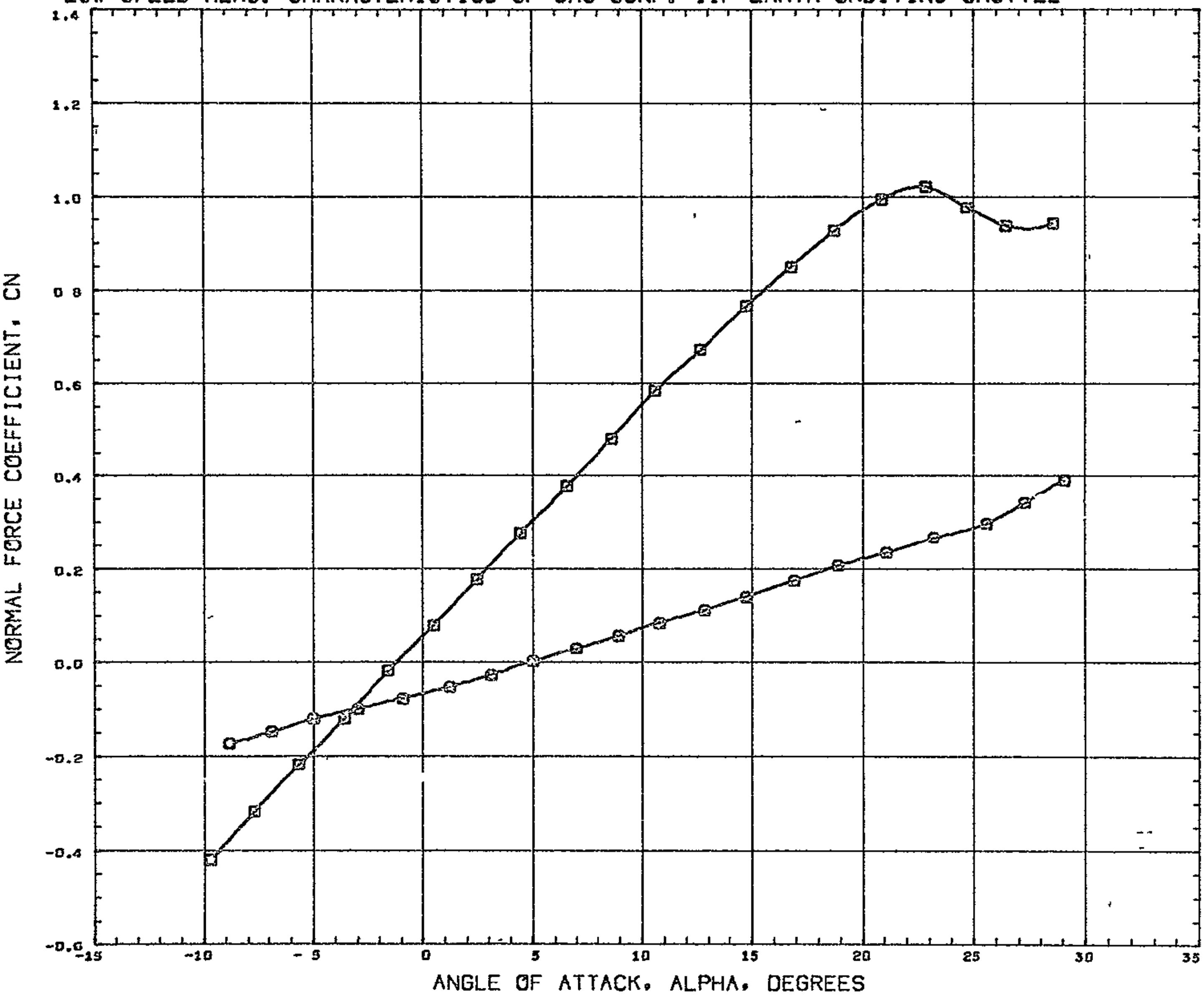
BETA 0 000 FLAP 0.000

REFERENCE INFORMATION

REFS	2 5000	SQ FT.
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(BCL011)	○	GWTT 279-GAC IIF CONF EOS-B2N1
(BCL021)	□	GWTT 279-GAC IIF CONF EOS-B2N1W1

PARAMETRIC VALUES

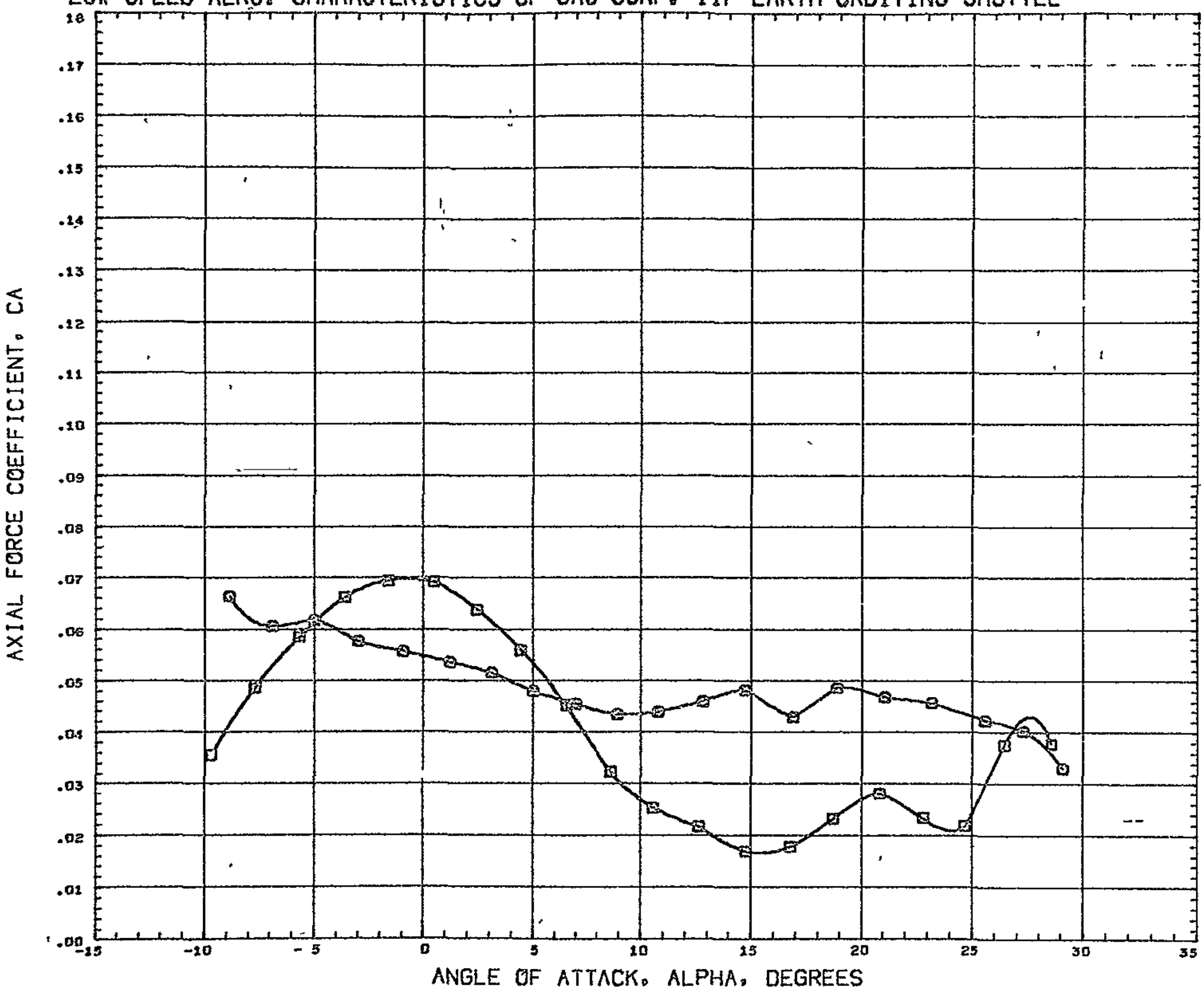
BETA 0.000 FLAP 0.000

REFERENCE INFORMATION

REFS	2.5000	SQ FT
REFL	1.2075	FT
REFB	2.5000	FT.
XMRP	1094.0040	IN
YMRP	0.0000	IN
ZMRP	972.0004	IN
SCALE	0.0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET SYMBOL CONFIGURATION DESCRIPTION
(BCL011) ○ GWTT 279-GAC IIF CONF.EOS-B2N1
(BCL021) □ GWTT 279-GAC IIF CONF EOS-B2N1W1

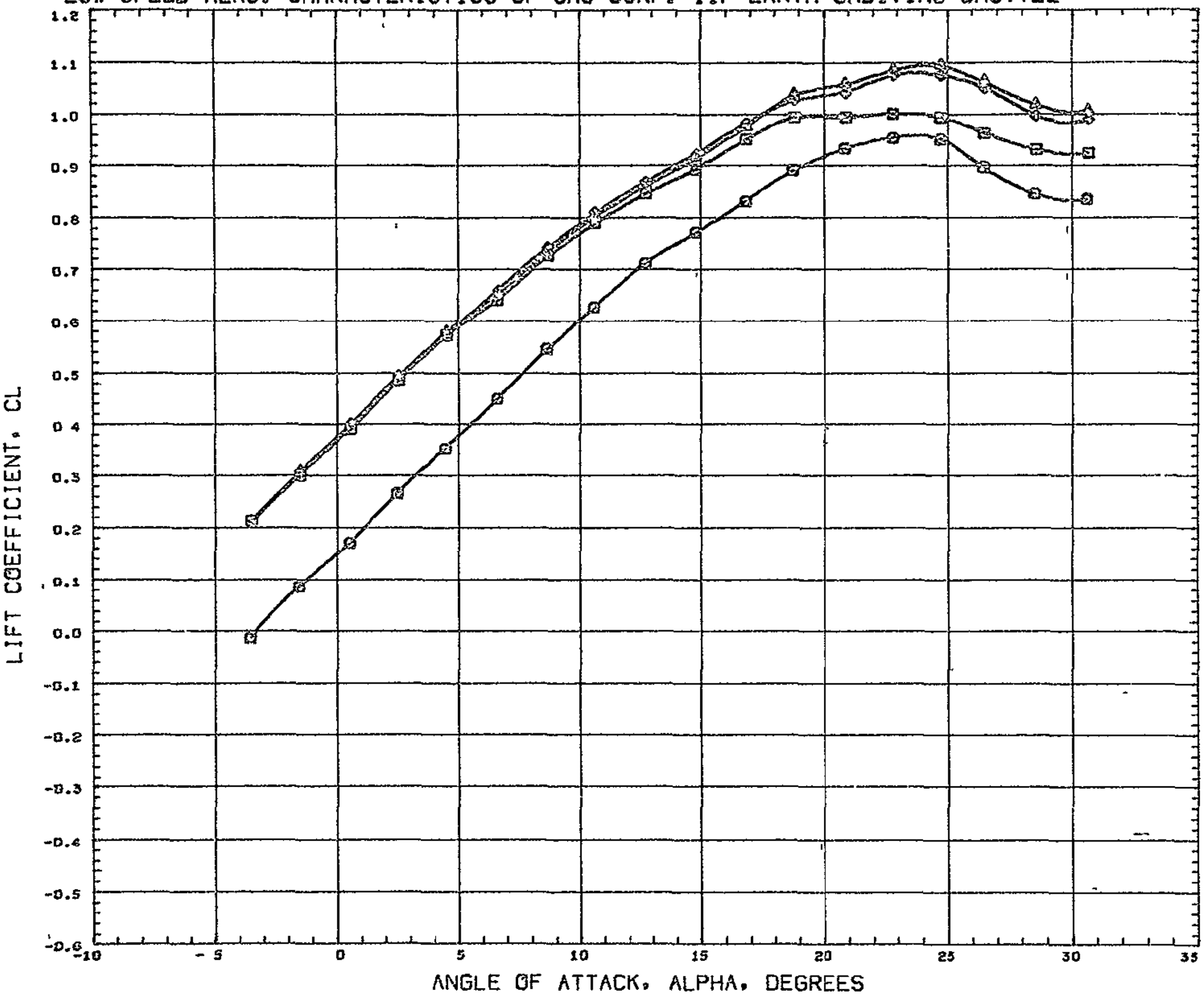
PARAMETRIC VALUES
BETA 0.000 FLAP 0.000

REFERENCE INFORMATION

REFS	2.5000	SQ FT
REFL	1.2075	FT
REFB	2.5000	FT
XMRP	1094.0040	IN
YMRP	0.0000	IN
ZMRP	972.0004	IN
SCALE	0.0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL063)	○	GWTT 279-GAC IIF CONF EOS-B10N1W4
(SCL073)	□	GWTT 279-GAC IIF CONF EOS-B10N1W4F30
(SCL083)	◇	GWTT 279-GAC IIF CONF. EOS-B10N1W4F30C
(SCL093)	△	GWTT 279-GAC IIF CONF EOS-B10N1W4F30C10

MACH 0.170

PARAMETRIC VALUES

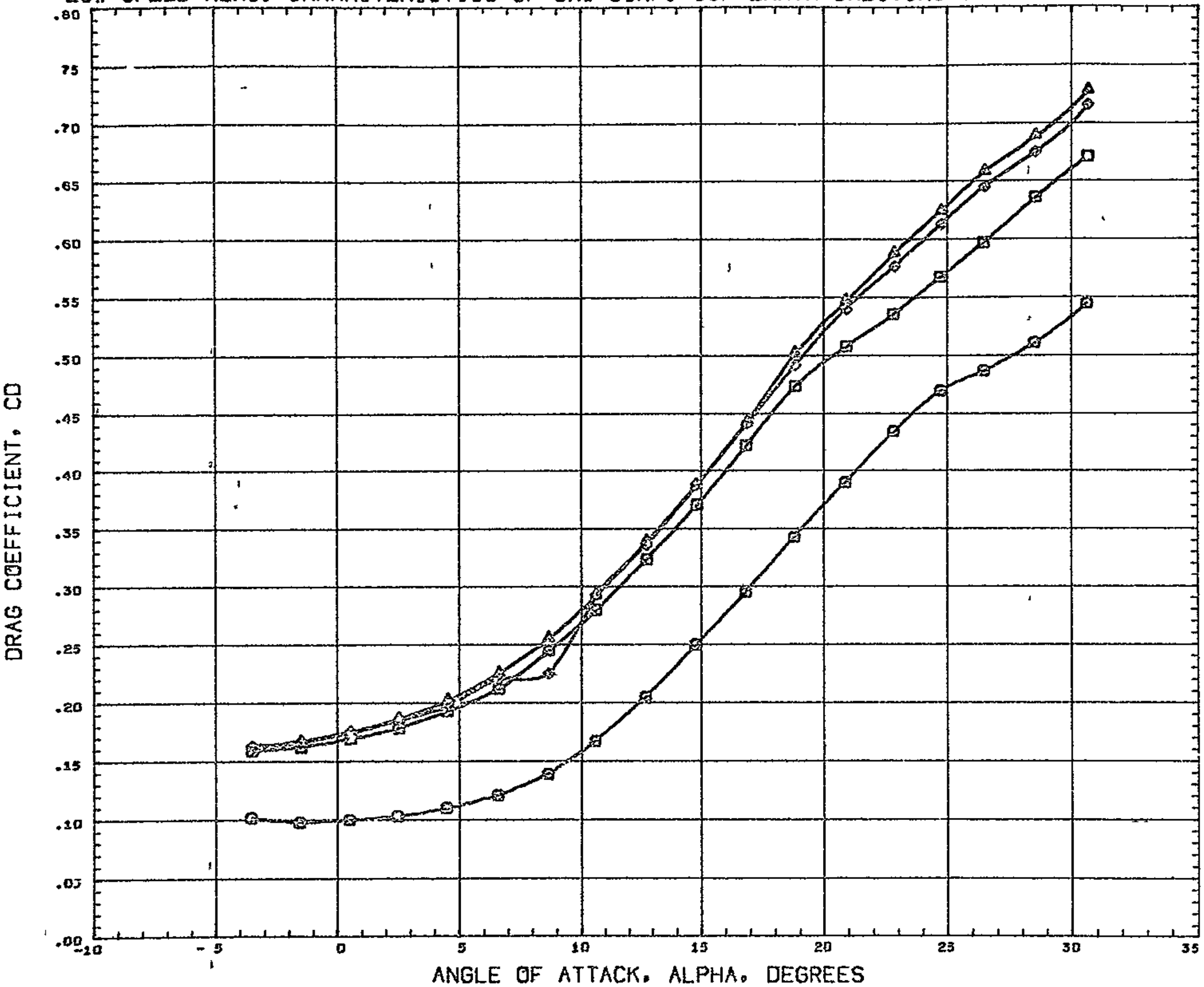
BETA 0.000 FLAP 0.000

REFERENCE INFORMATION

REFS	2.5000	SQ FT
REFL	1.2075	FT
REFB	2.5000	FT
XMRP	1094.0040	IN
YMRP	0.0000	IN
ZMRP	972.0004	IN
SCALE	0.0250	

2 (H)

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL063)	○	GWTT 279-GAC IIF CONF EOS-B10N1W4
(SCL073)	□	GWTT 279-GAC IIF CONF EOS-B10N1W4F30
(SCL083)	◇	GWTT 279-GAC IIF CONF EOS-B10N1W4F30C
(SCL093)	△	GWTT 279-GAC IIF CONF. EOS-B10N1W4F30C10

PARAMETRIC VALUES

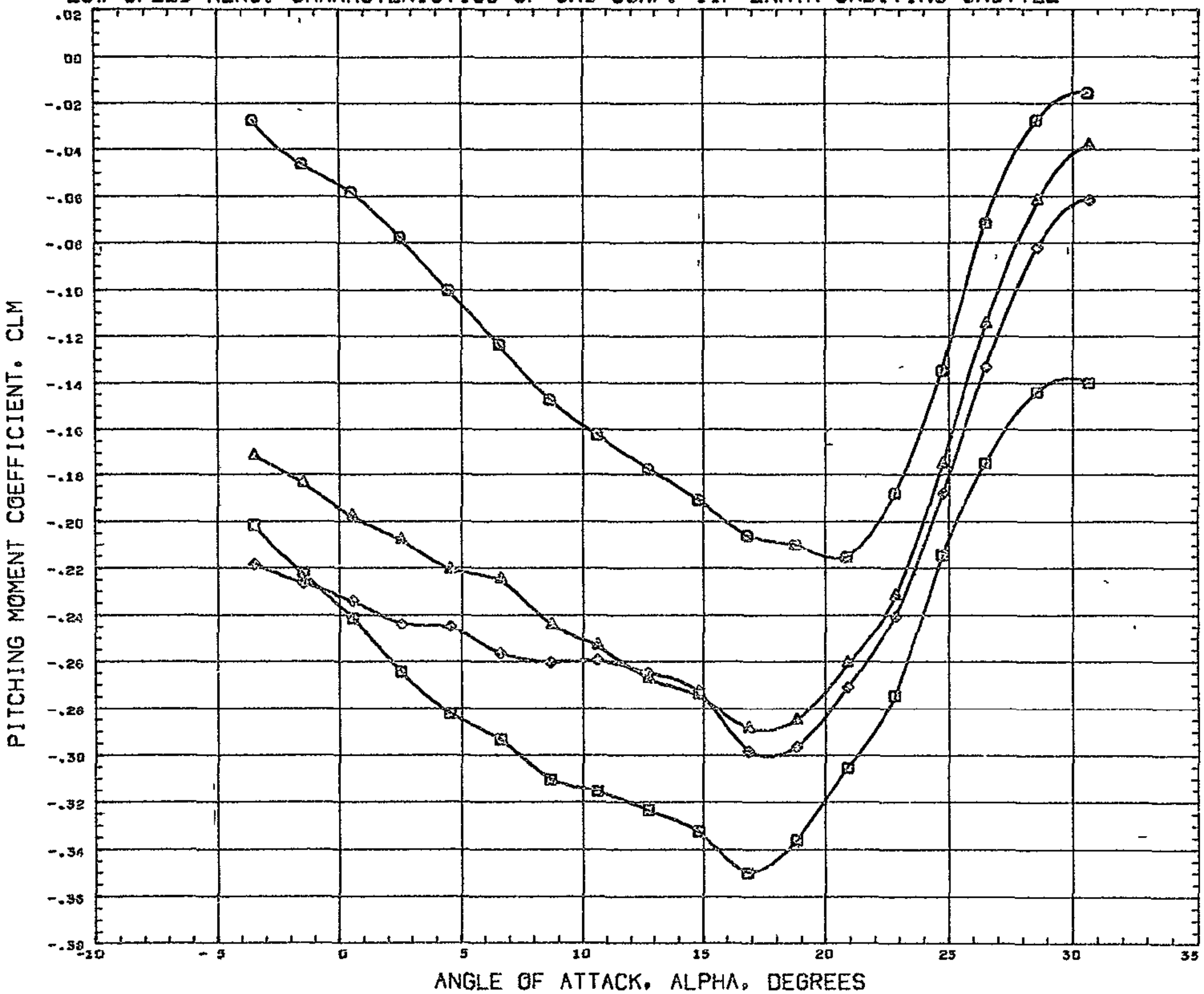
BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMPF	972 000/	IN
SCALE	0 0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCLO63)	O	GWTT 279-GAC IIF CONF. EOS-B1ON1W4
(SCLO73)	□	GWTT 279-GAC IIF CONF. EOS-B1ON1W4F30
(SCLO83)	◇	GWTT 279-GAC IIF CONF. EOS-B1ON1W4F30C
(SCLO93)	△	GWTT 279-GAC IIF CONF EOS-B1ON1W4F30C10

MACH 0 170

PARAMETRIC VALUES

BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
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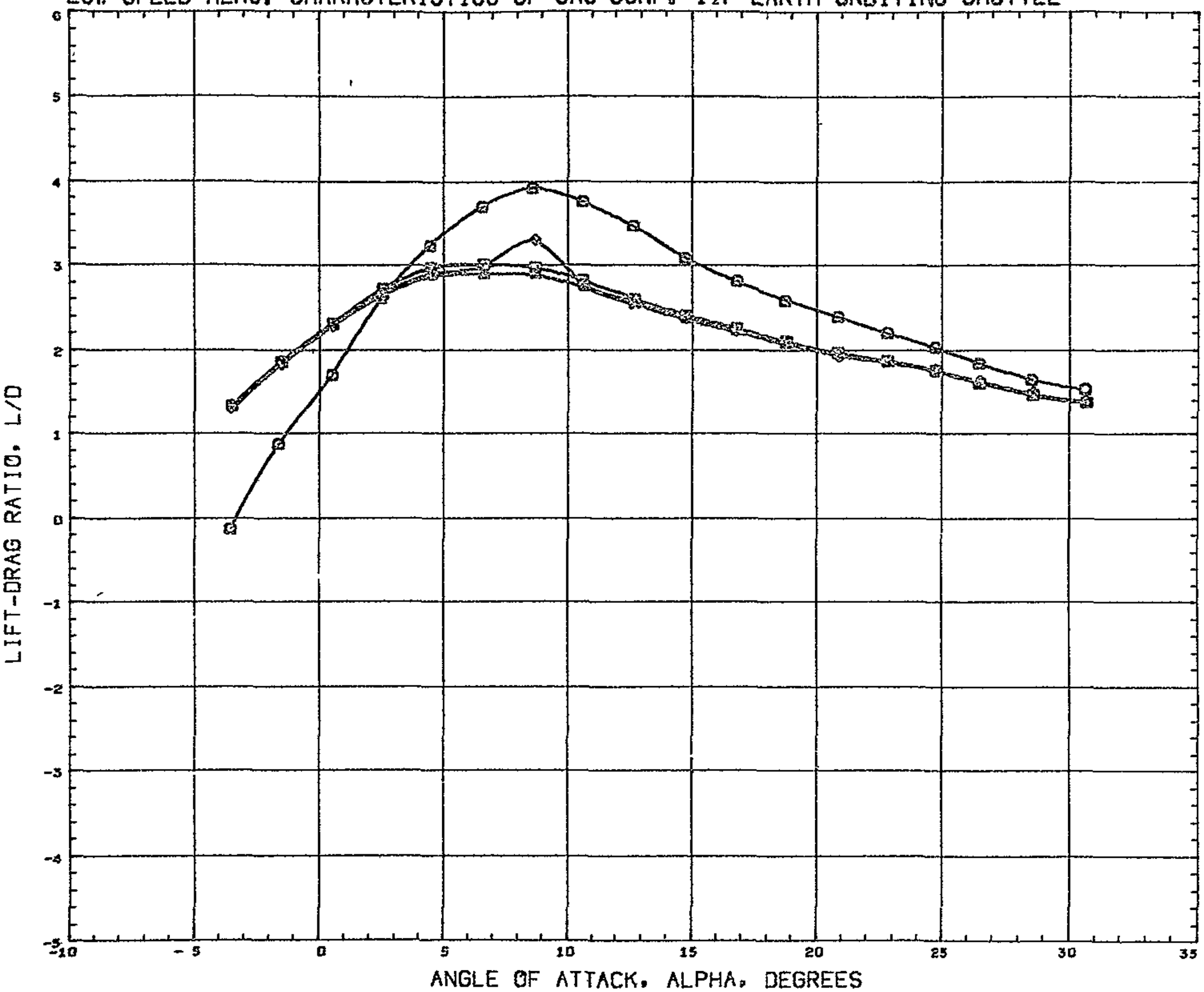
LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL063)	O	GWTT 279-GAC IIF CONF. EOS-B10N1W4
(SCL073)	□	GWTT 279-GAC IIF CONF EOS-B10N1W4F30
(SCL083)	◇	GWTT 279-GAC IIF CONF EOS-B10N1W4F30C
(SCL093)	Δ	GWTT 279-GAC IIF CONF. EOS-B10N1W4F30C10

PARAMETRIC VALUES

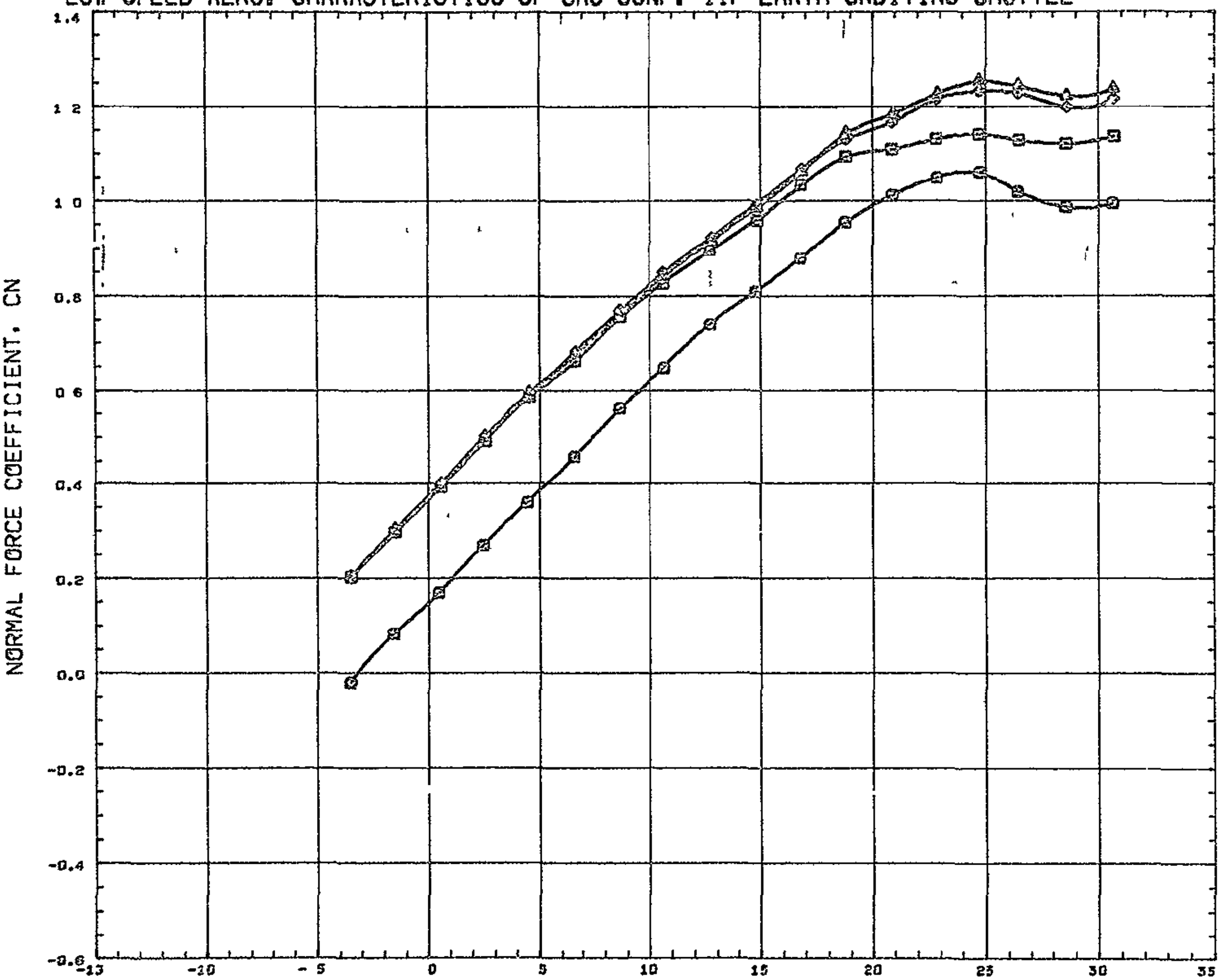
BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(BCL063)	○	GWTT 279-GAC IIF CONF EOS-B10N1W4
(BCL073)	□	GWTT 279-GAC IIF CONF. EOS-B10N1W4F30
(BCL083)	◇	GWTT 279-GAC IIF CONF EOS-B10N1W4F30C
(BCL093)	△	GWTT 279-GAC IIF CONF EOS-B10N1W4F30C10

MACH 0 170

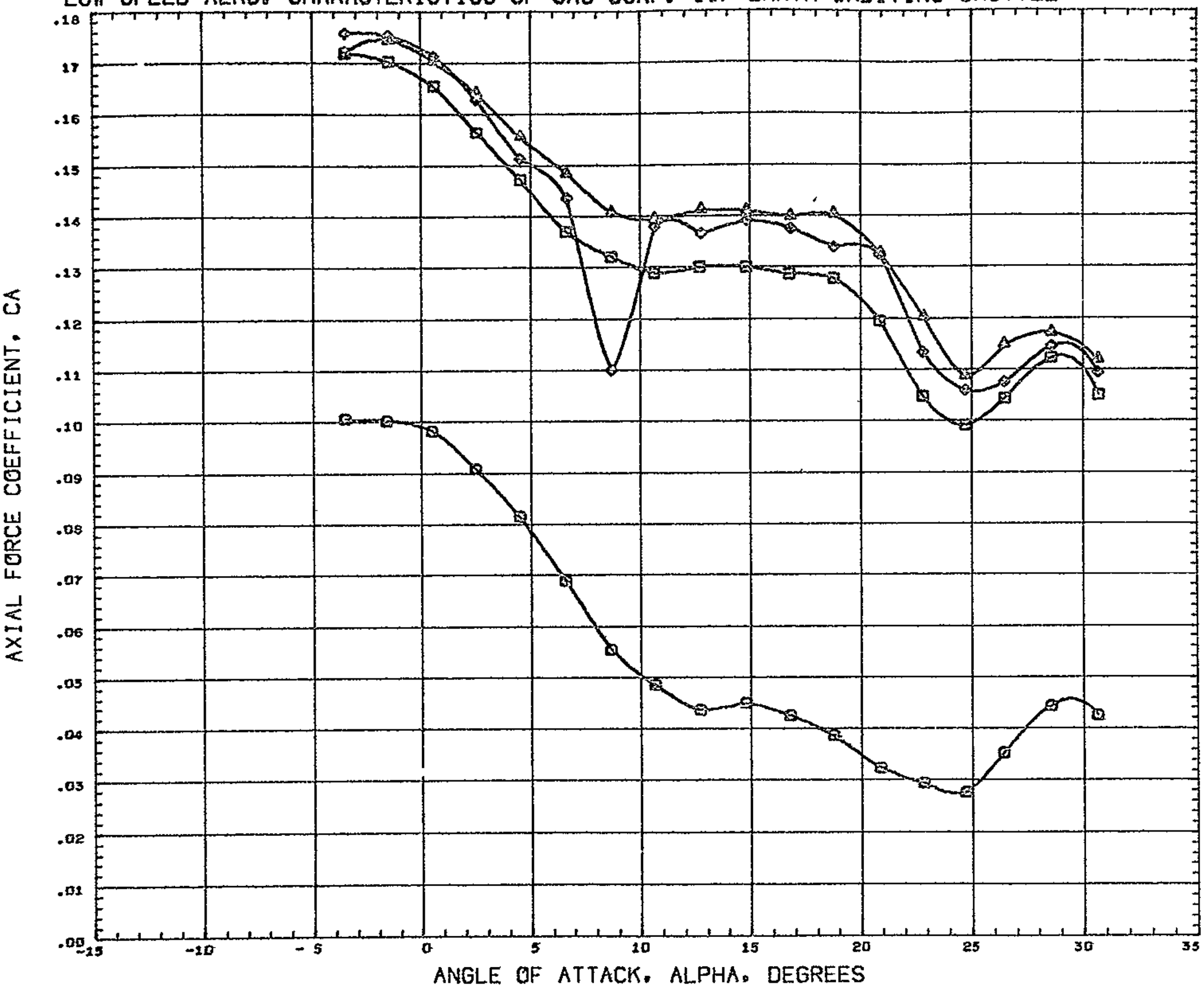
PARAMETRIC VALUES

BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1.2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0.0250	

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(BCL063)	○	GWTT 279-GAC IIF CONF. EOS-B1ON1W4
(BCL073)	□	GWTT 279-GAC IIF CONF. EOS-B1ON1W4F30
(BCL083)	◇	GWTT 279-GAC IIF CONF. EOS-B1ON1W4F30C
(BCL093)	△	GWTT 279-GAC IIF CONF EOS-B1ON1W4F30C10

MACH 0 170

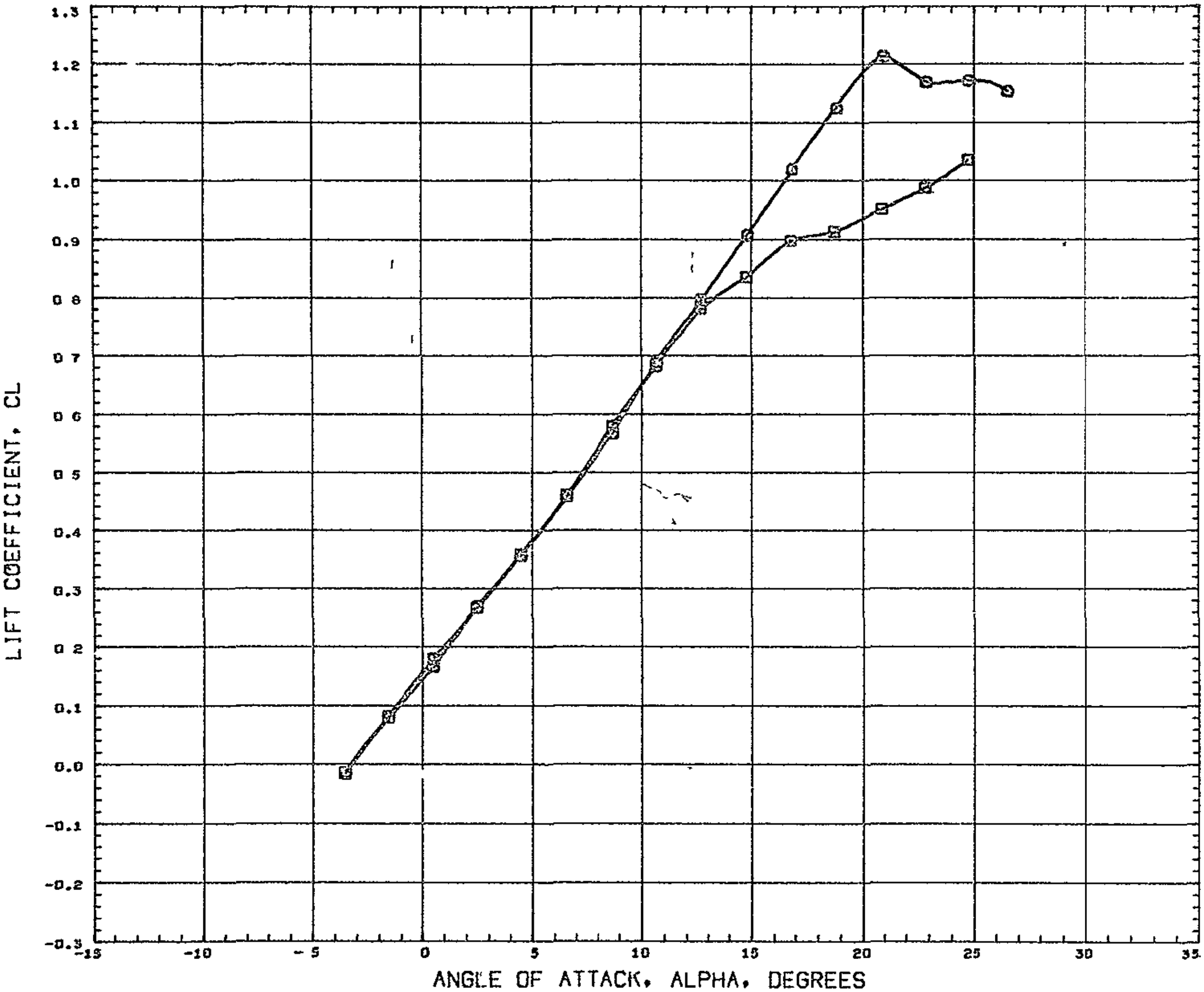
PARAMETRIC VALUES

BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCPIPTION
(SCL103)	○	GWTT 279-GAC IIF CONF EOS-B1DN1W12
(SCL113)	□	GWTT 279-GAC IIF CONF. EOS-B1DN1W12K

PARAMETRIC VALUES

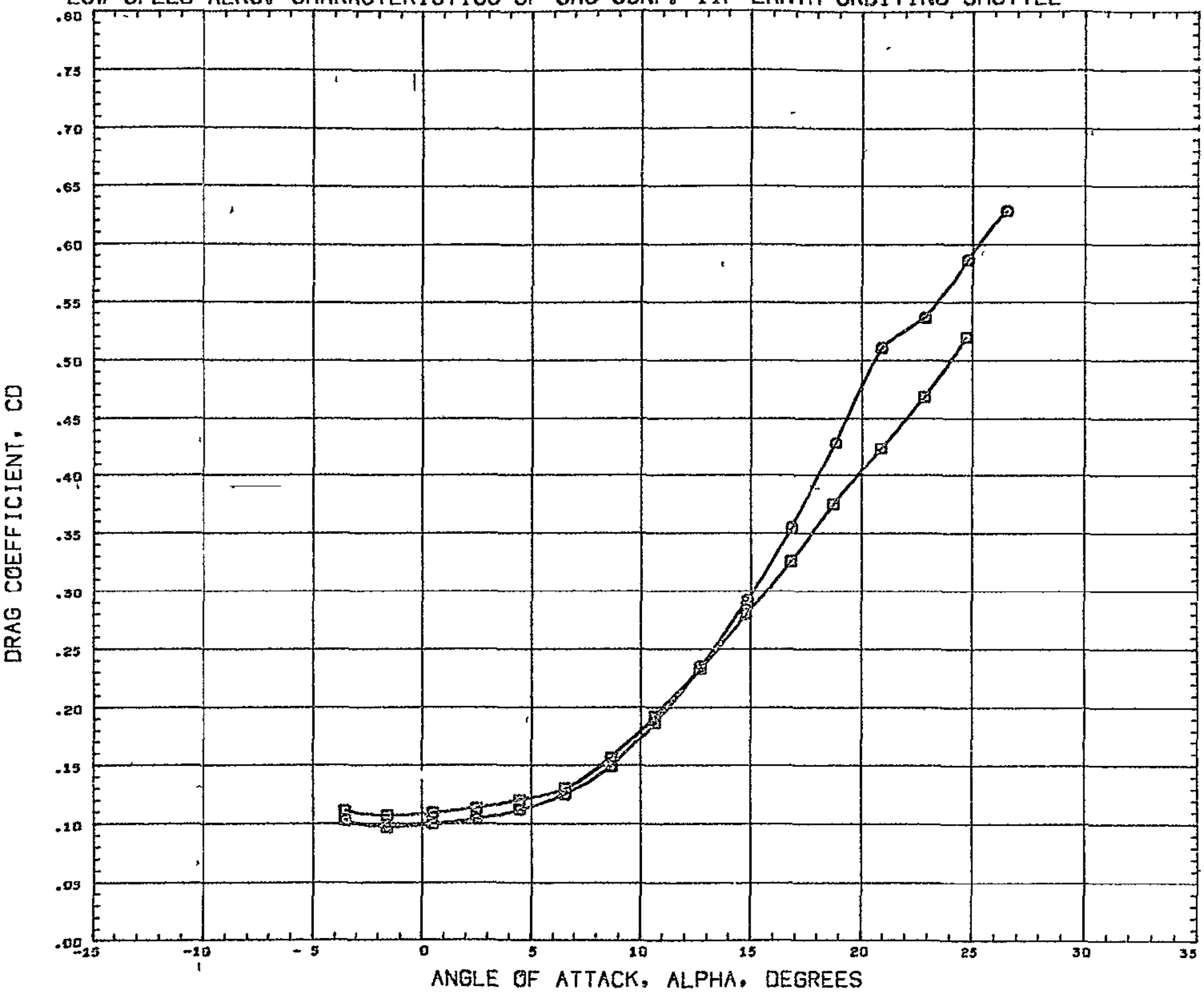
BETA 0.000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRF	1094 0040	IN
YMRF	0 0000	IN
ZMRF	972 0004	IN
SCALE	0 0250	

MACH 0 170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL103)	O	GWTT 279-GAC IIF CONF. EOS-B10N1W12
(SCL113)	□	GWTT 279-GAC IIF CONF. EOS-B10N1W12K

PARAMETRIC VALUES

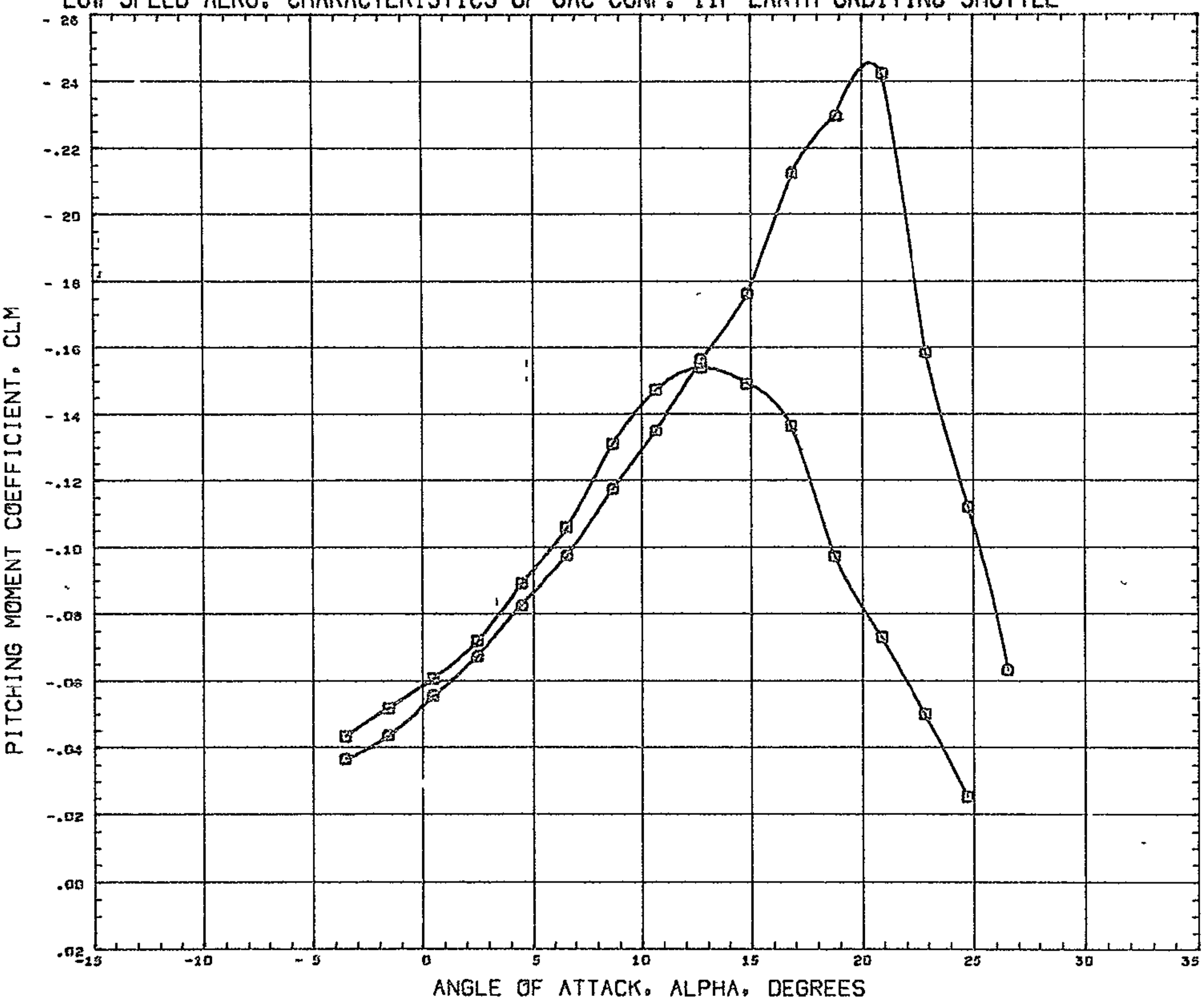
BETA 0.000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL103)	O	GWTT 279-GAC IIF CONF EOS-B1ON1W12
(SCL113)	□	GWTT 279-GAC IIF CONF. EOS-B1ON1W12K

PARAMETRIC VALUES

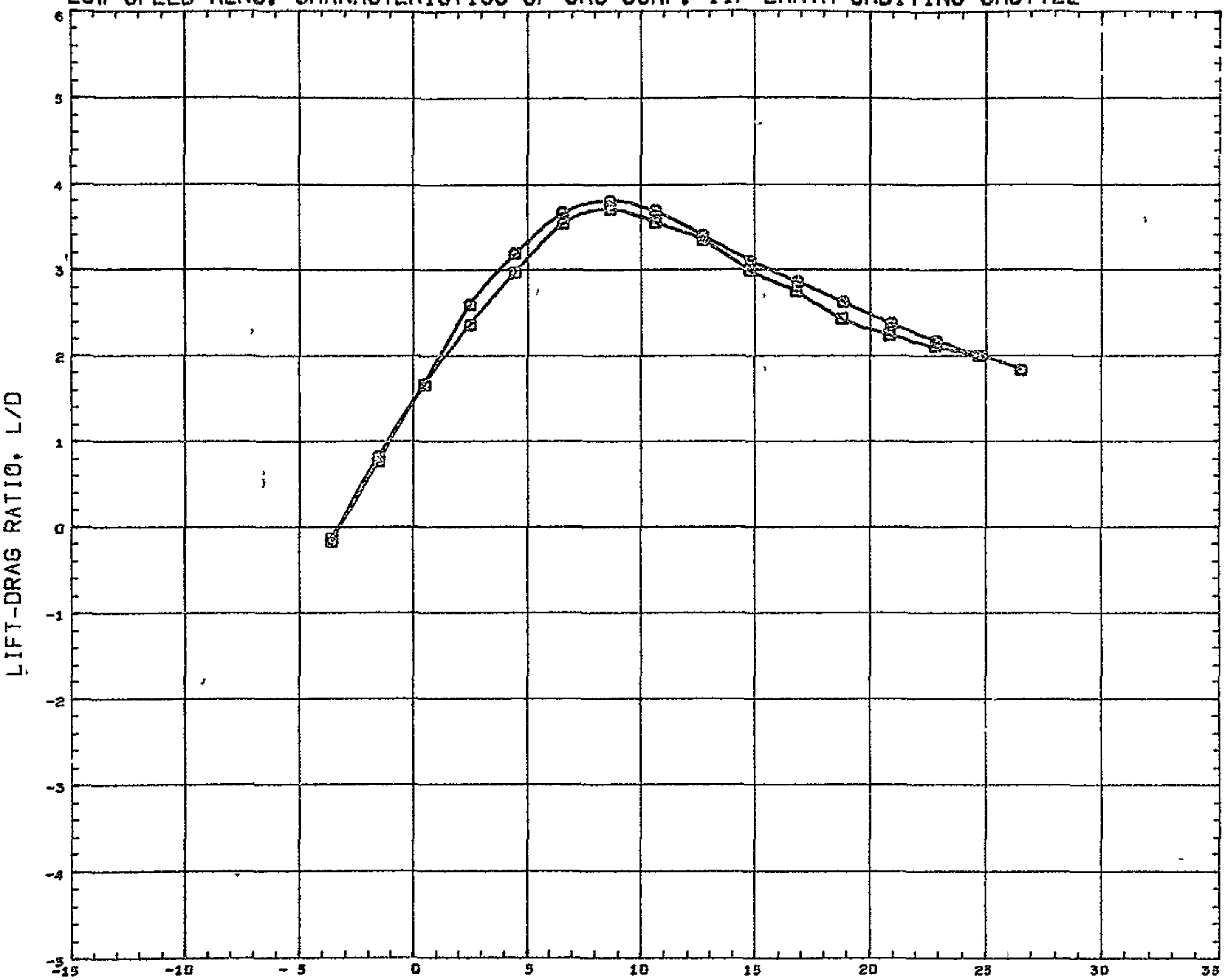
BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT.
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0 170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL103)	○	GWTT 279-GAC IIF CONF. EOS-B1DN1W12
(SCL113)	□	GWTT 279-GAC IIF CONF. EOS-B1DN1W12K

PARAMETRIC VALUES

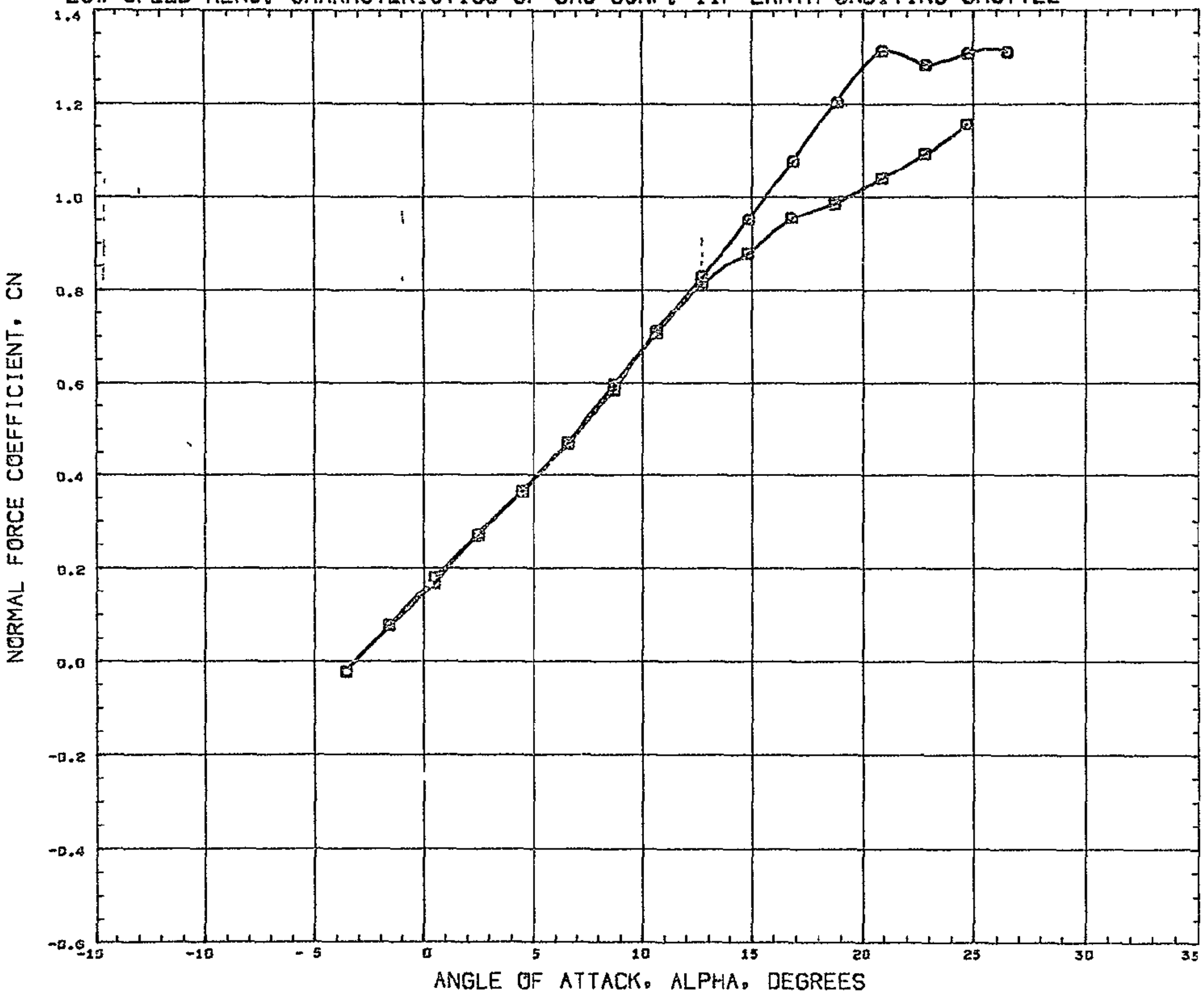
BETA 0.000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(BCL103)	○	GWTT 279-GAC IIF CONF EOS-B10N1W12
(BCL113)	□	GWTT 279-GAC IIF CONF. EOS-B10N1W12K

PARAMETRIC VALUES

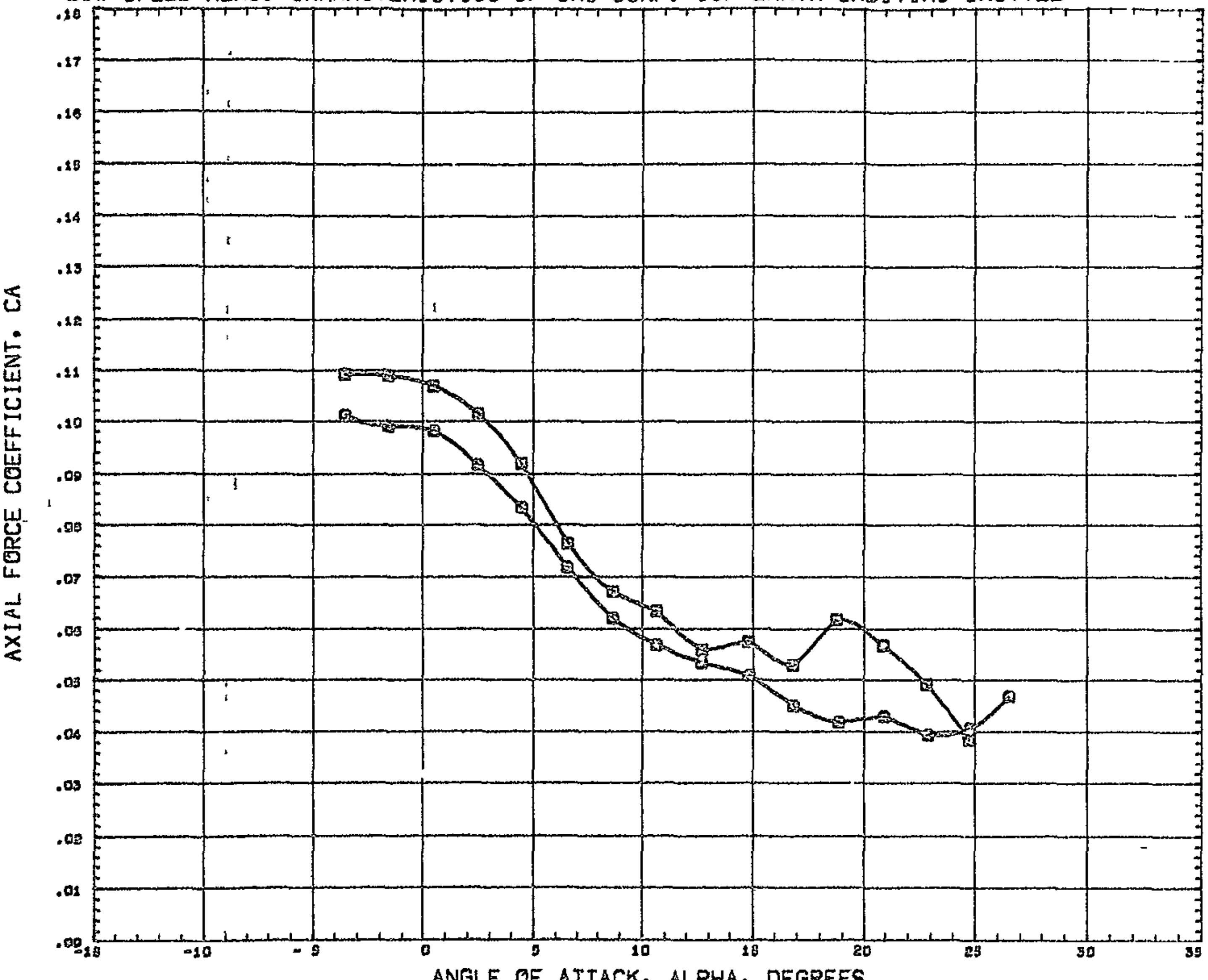
BETA 0 000 FLAP 0 000

MACH 0 170

REFERENCE INFORMATION

REFS	2.5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(BCL103)	○	GWTT 279-GAC IIF CONF. EOS-B10N1W12
(BCL113)	□	GWTT 279-GAC IIF CONF. EOS-B10N1W12K

PARAMETRIC VALUES

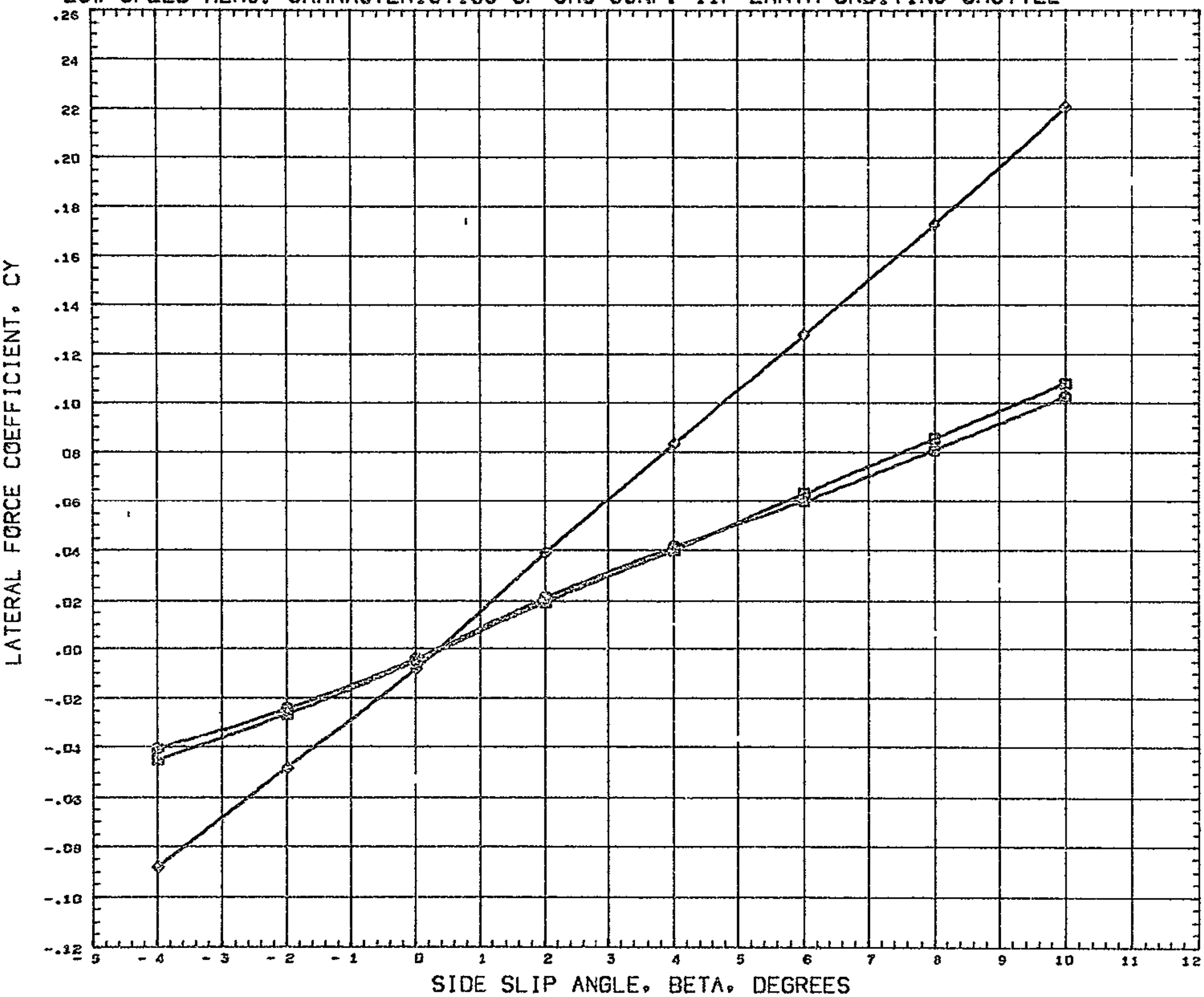
BETA 0.000 FLAP 0.000

REFERENCE INFORMATION

REFS	2.5000	SQ FT.
REFL	1.2075	FT.
REFB	2.5000	FT.
XMRP	1094.0040	IN
YMRP	0.0000	IN.
ZMRP	972.0004	IN.
SCALE	0.0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
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(SCL032)	□	GWTT 279-GAC IIF CONF EOS-B1N1W1
(SCL042)	◇	GWTT 279-GAC IIF CONF EOS-B1N1W1T

MACH 0.170

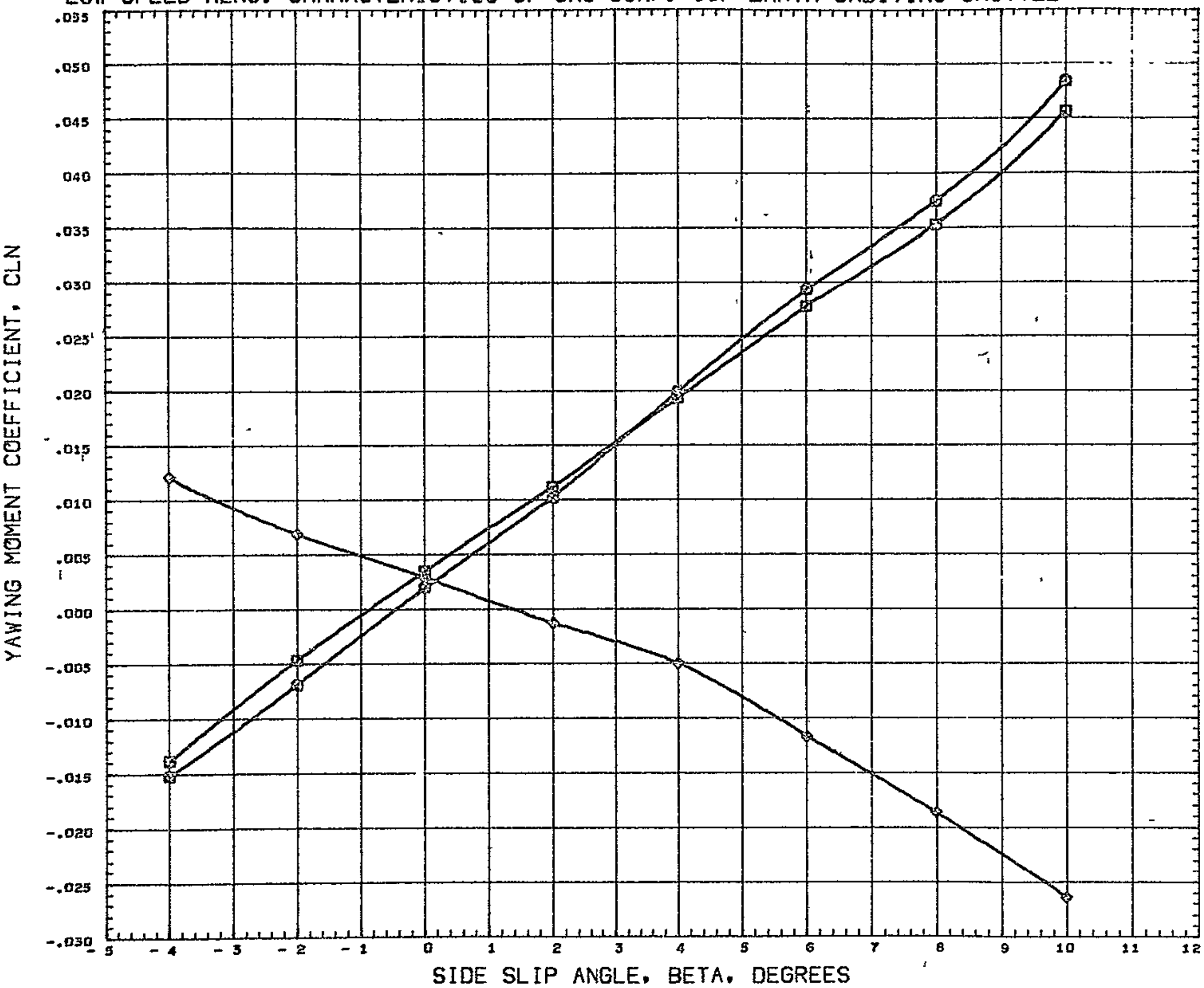
PARAMETRIC VALUES

ALPHA 6.000 FLAP 0.000

REFERENCE INFORMATION

REFS	2.5000	SQ FT
REFL	1.2075	FT
REFB	2.5000	FT
XMRP	1094.0040	IN
YMRP	0.0000	IN
ZMRP	972.0004	IN
SCALE	0.0250	

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL052)	○	GWTT 279-GAC IIF CONF EOS-B1N1
(SCL032)	□	GWTT 279-GAC IIF CONF. EOS-B1N1W1
(SCL042)	◇	GWTT 279-GAC IIF CONF. EOS-B1N1W1T

PARAMETRIC VALUES

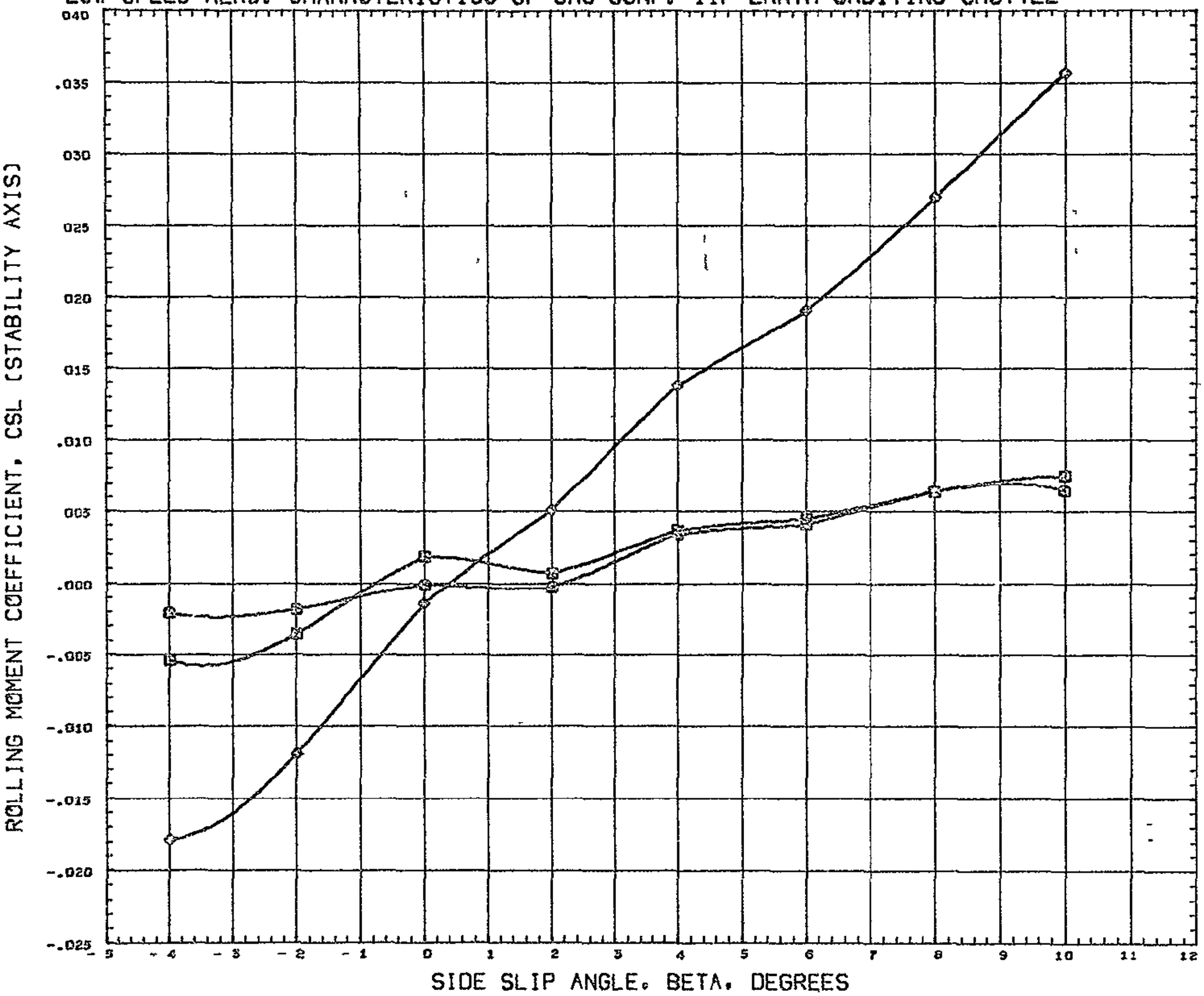
ALPHA 6 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0 170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL052)	O	GWTT 279-GAC IIF CONF EOS-B1N1
(SCL032)	□	GWTT 279-GAC IIF CONF EOS-B1N1W1
(SCL042)	◇	GWTT 279-GAC IIF CONF EOS-B1N1W1T

PARAMETRIC VALUES

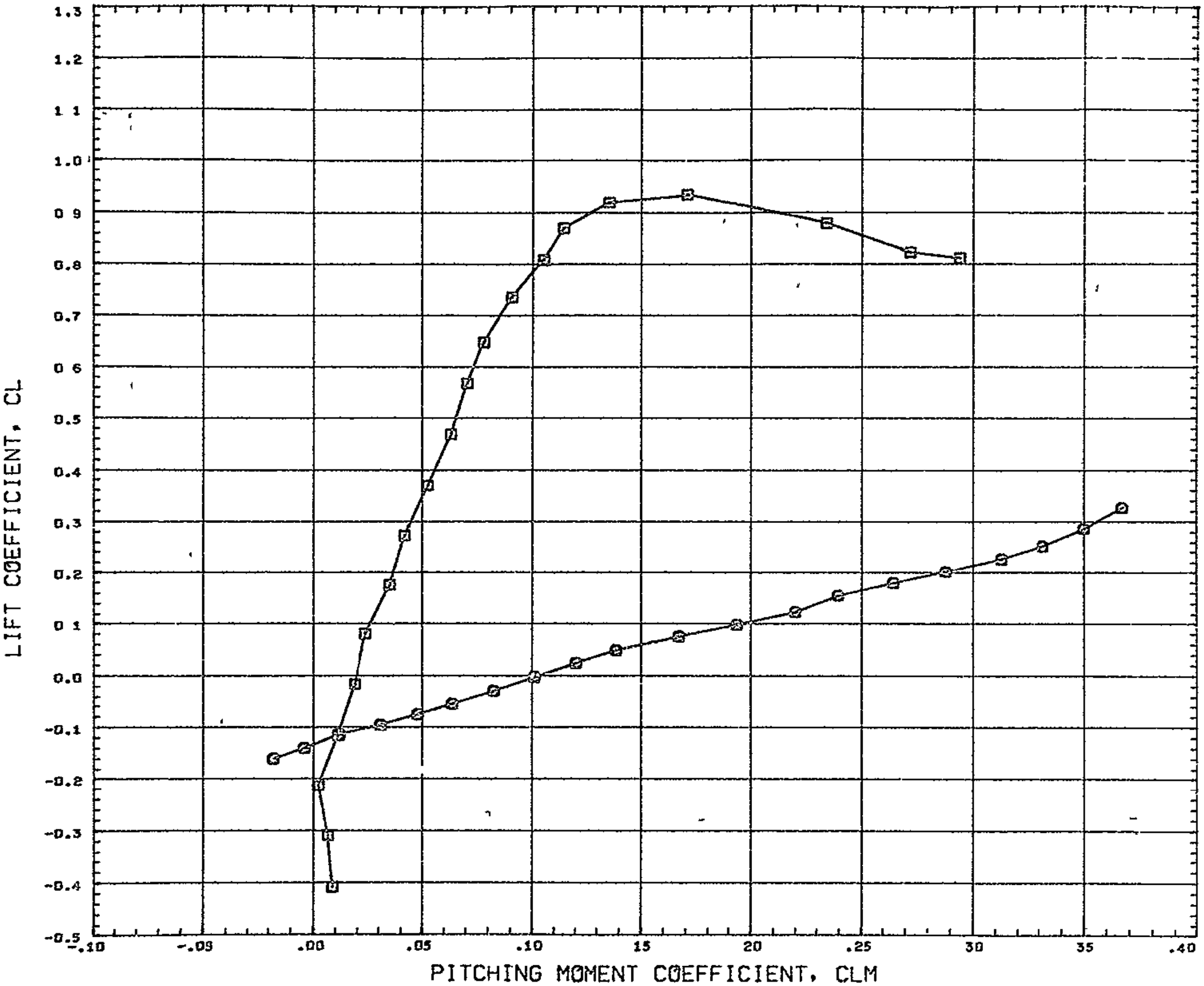
ALPHA 6 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0.0250	

MACH 0 170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL011)	○	GWTT 279-GAC IIF CONF EOS-B2N1
(SCL021)	□	GWTT 279-GAC IIF CONF. EOS-B2N1W1

PARAMETRIC VALUES

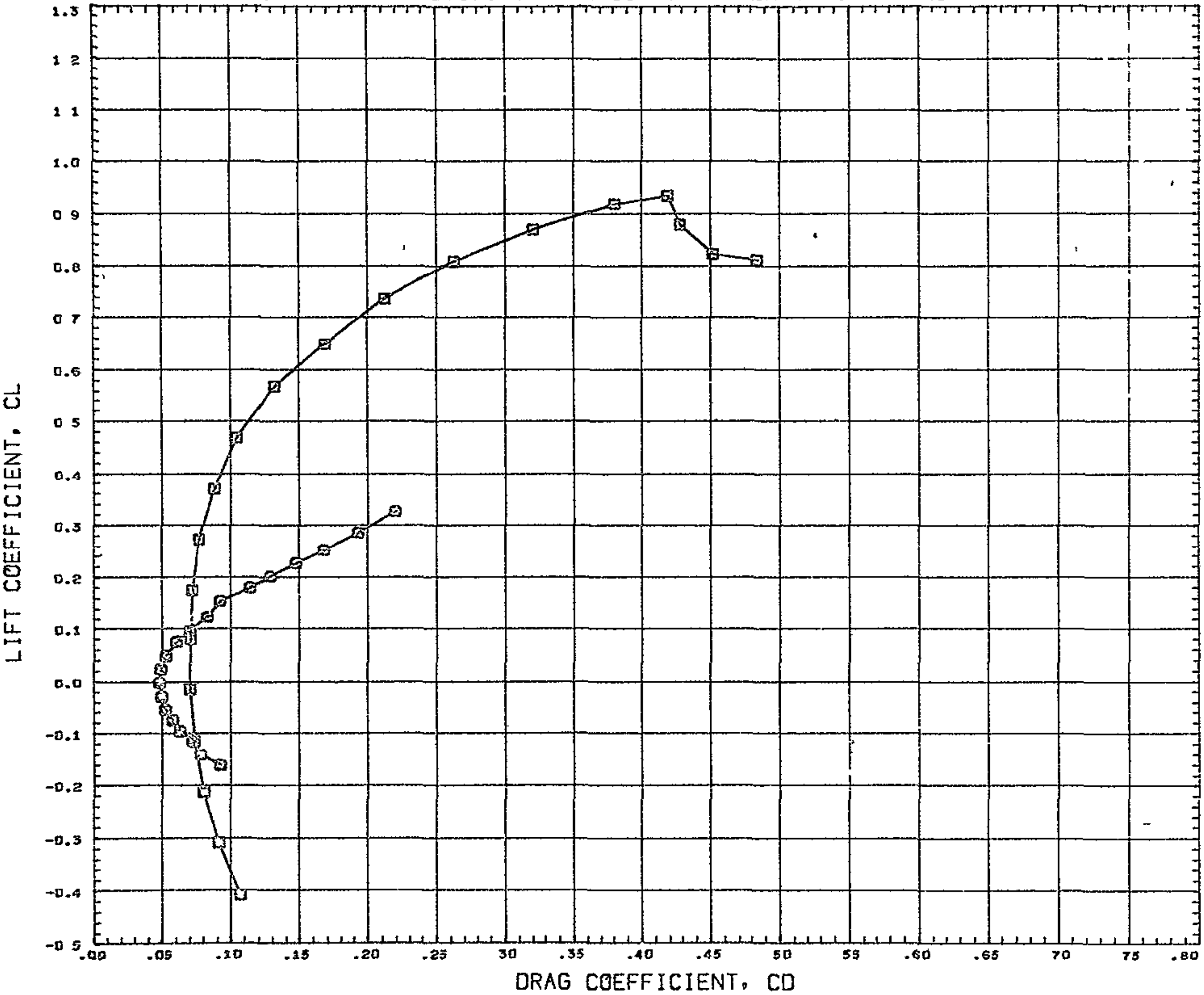
BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT.
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0 170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL011)	O	GWTT 279-GAC IIF CONF EOS-B2N1
(SCL021)	□	GWTT 279-GAC IIF CONF EOS-B2N1W1

PARAMETRIC VALUES

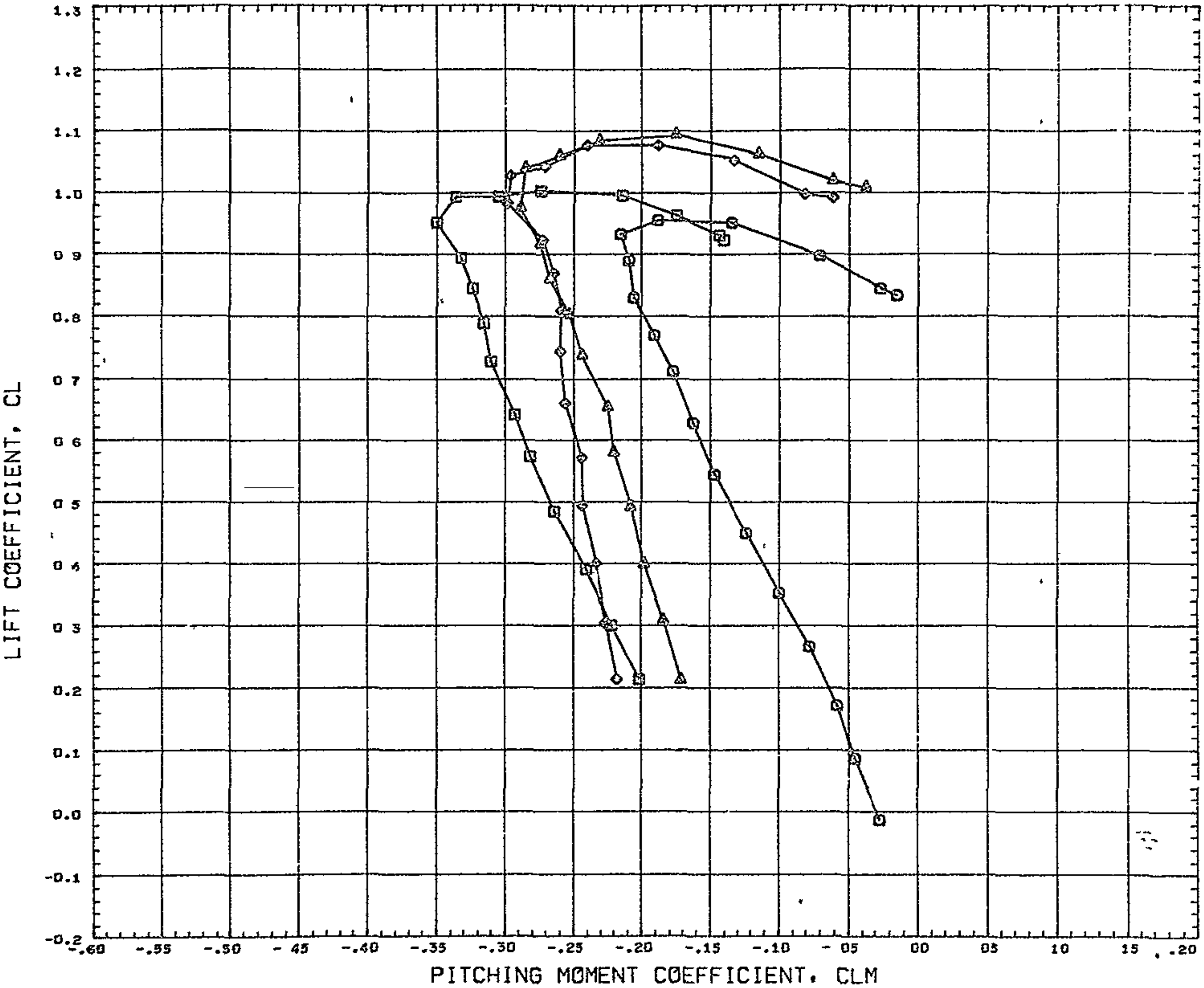
BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1.2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0 170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL063)	O	GWTT 279-GAC IIF CONF EOS-B10N1W4
(SCL073)	□	GWTT 279-GAC IIF CONF EOS-B10N1W4F30
(SCL083)	◇	GWTT 279-GAC IIF CONF EOS-B10N1W4F30C
(SCL093)	△	GWTT 279-GAC IIF CONF EOS-B10N1W4F30C10

MACH 0 170

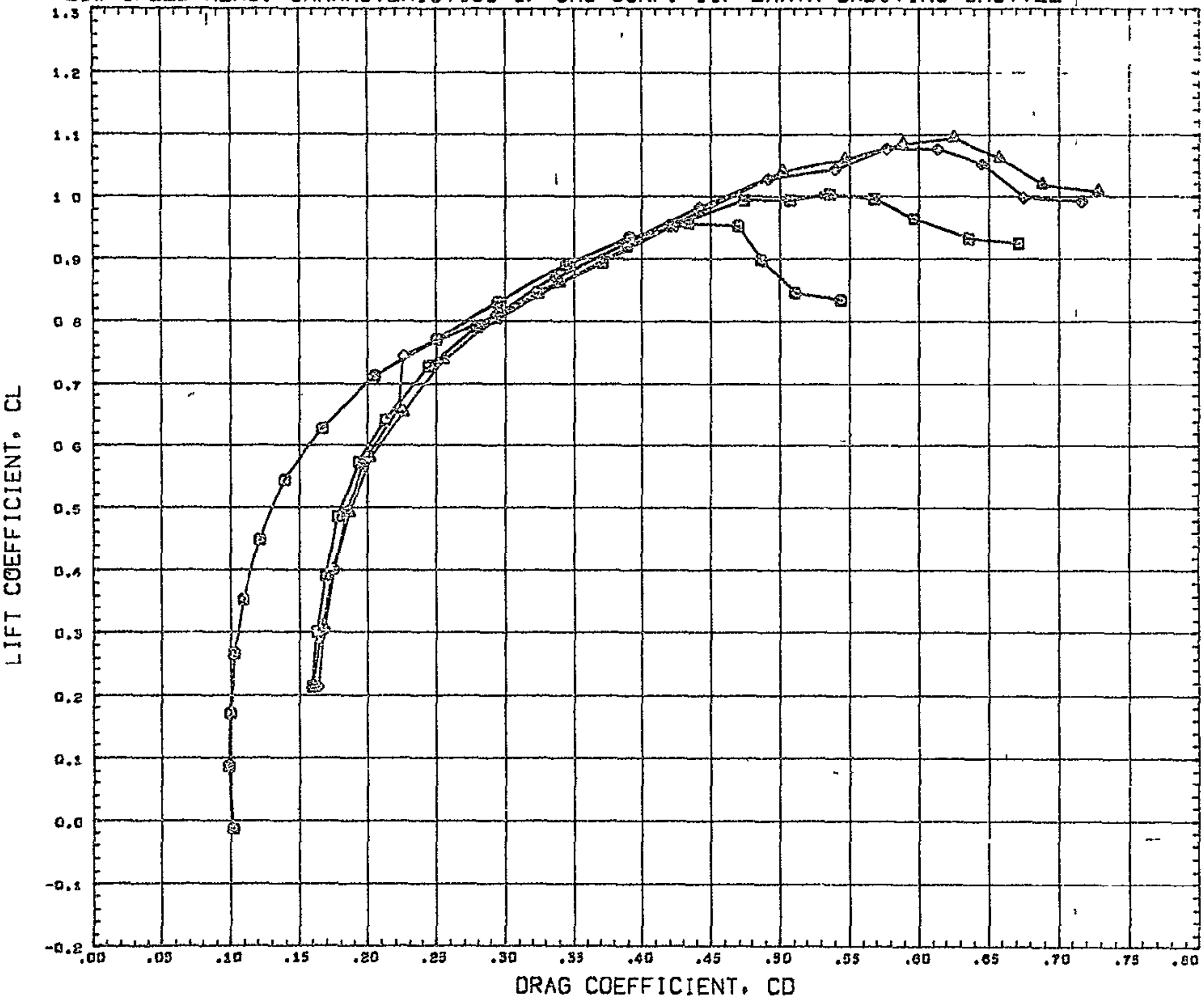
PARAMETRIC VALUES

BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRP	1094 0040	IN
YMRP	0 0000	IN
ZMRP	972 0004	IN
SCALE	0 0250	

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL063)	○	GWTT 279-GAC IIF CONF EOS-B10N1W4
(SCL073)	□	GWTT 279-GAC IIF CONF. EOS-B10N1W4F30
(SCL083)	◇	GWTT 279-GAC IIF CONF. EOS-B10N1W4F30C
(SCL093)	△	GWTT 279-GAC IIF CONF. EOS-B10N1W4F30C10

PARAMETRIC VALUES

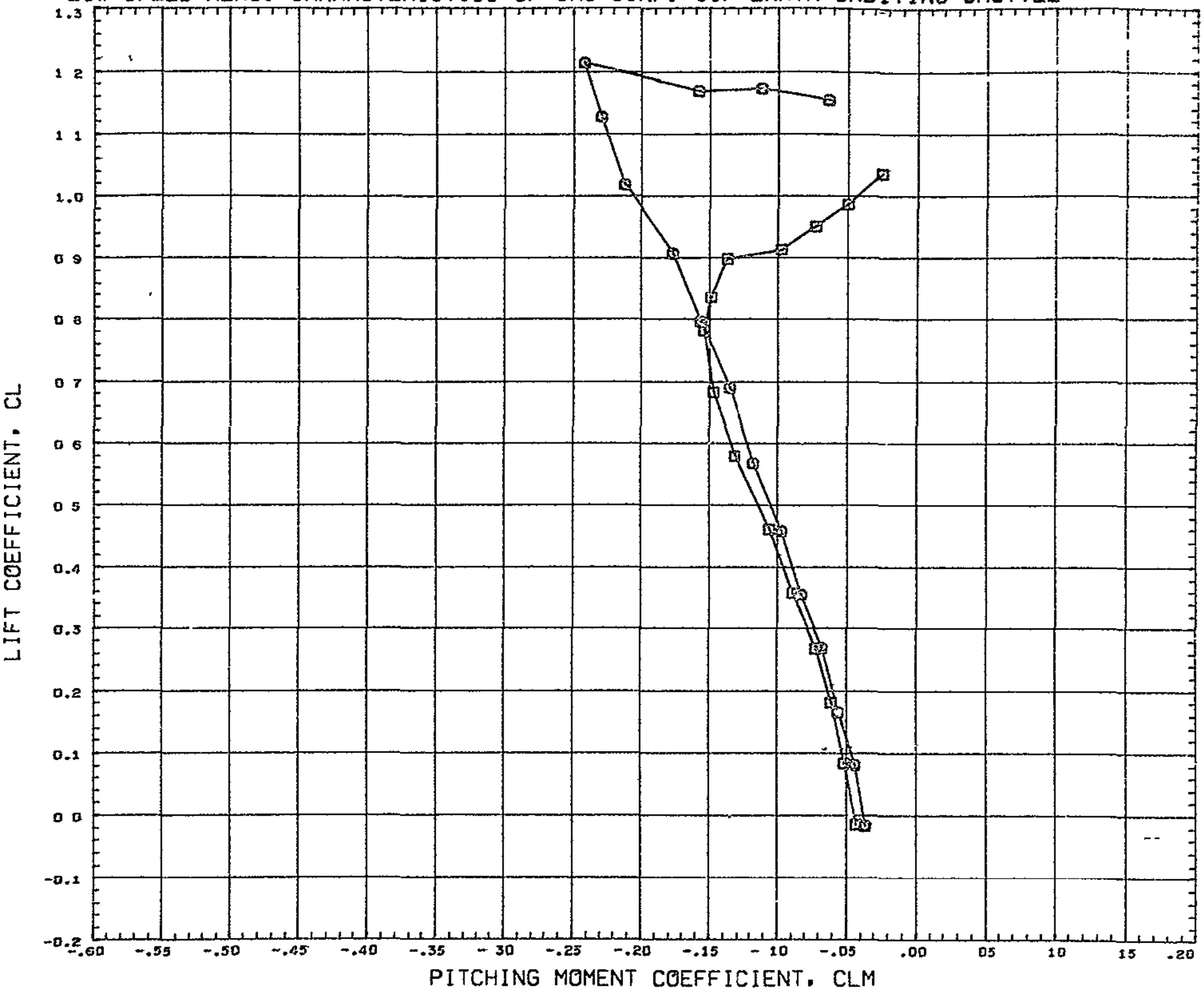
BETA 0.000 FLAP 0 000

REFERENCE INFORMATION

REFS	2.5000	SQ FT
REFL	1.2075	FT
REFB	2.5000	FT
XMRP	1094 0040	IN.
YMRP	0 0000	IN.
ZMRP	972 0004	IN
SCALE	0 0250	

MACH 0 170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL103)	○	GWTT 279-GAC IIF CONF. EOS-B10N1W12
(SCL113)	□	GWTT 279-GAC IIF CONF. EOS-B10N1W12K

PARAMETRIC VALUES

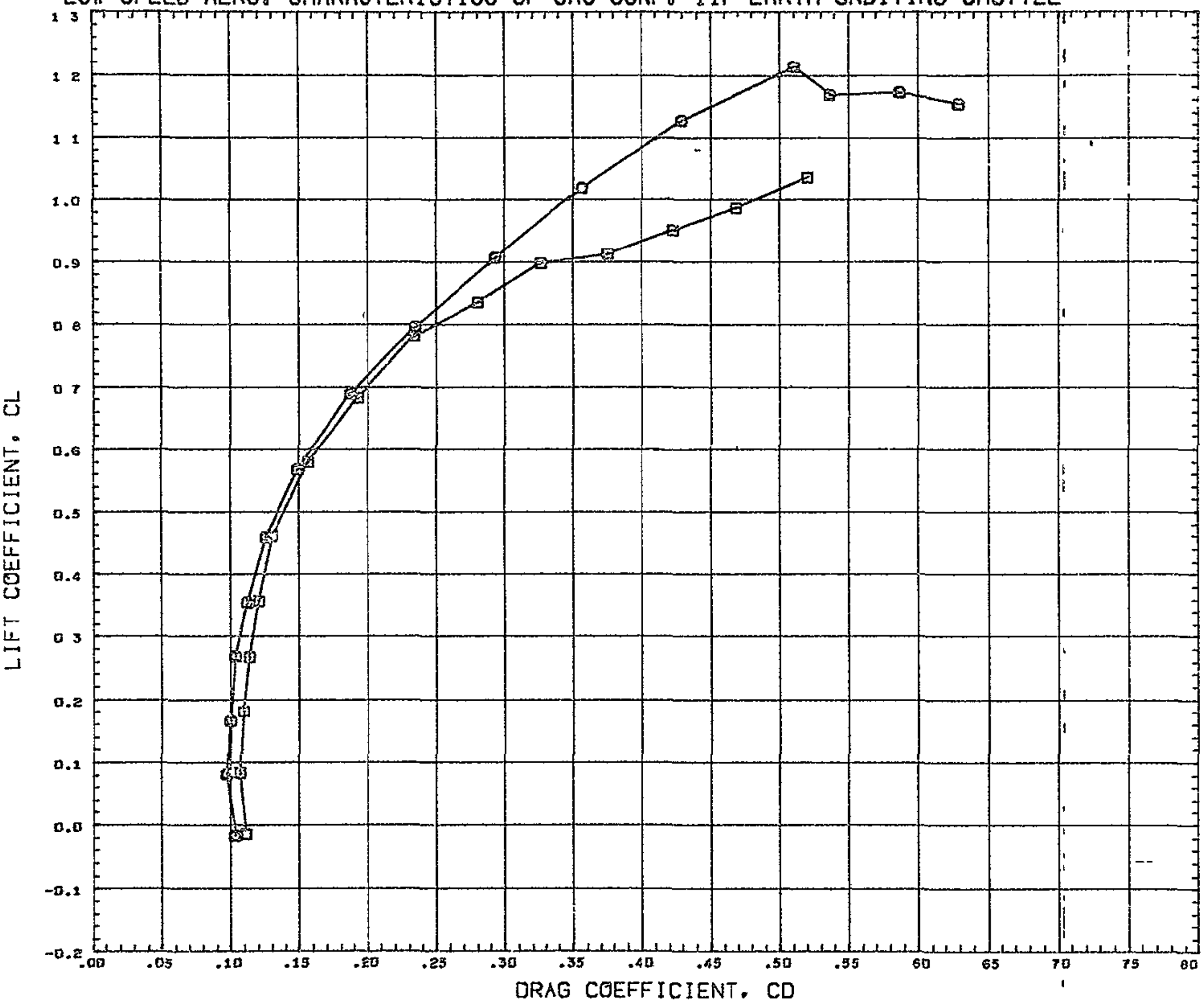
BETA 0.000 FLAF 0.000

REFERENCE INFORMATION

REFS	2.5000	SQ FT.
REFL	1.2075	FT
REFB	2.5000	FT
XMRP	1094.0040	IN
YMRP	0.0000	IN
ZMRP	972.0004	IN
SCALE	0.0250	

MACH 0.170

LOW SPEED AERO. CHARACTERISTICS OF GAC CONF. IIF EARTH ORBITING SHUTTLE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(SCL103)	O	GWTT 279-GAC IIF CONF. EOS-B10N1W12
(SCL113)	□	GWTT 279-GAC IIF CONF EOS-B10N1W12K

PARAMETRIC VALUES

BETA 0 000 FLAP 0 000

REFERENCE INFORMATION

REFS	2 5000	SQ FT
REFL	1 2075	FT
REFB	2 5000	FT
XMRF	1094 0040	IN
YMRF	0 0000	IN
ZMRF	972 0004	IN
SCALE	0 0250	

MACH 0.170